THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—19TH YEAR. SYDNEY, SATURDAY, AUGUST 13, 1932. No. 7.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— PAGE.

The Bancroft Memorial Lecture, by W. A. OSBORNE, M.B., D.Sc., F.A.C.S. .. 191
"Prevention of Cancer of the Skin and Buccal Cavity", by E. H. MOLESWORTH, M.D. .. 196
"Remarks upon the Treatment of Buccal Cancer", by L. M. MCKILLOP, M.B., Ch.M., F.R.C.S., F.R.A.C.S. .. 199
"Cancer of the Buccal Cavity", by BASIL KILVINGTON, M.D., M.S. .. 202
"Spinal Anæsthesia", by R. FRANCIS MATTERS, M.D., F.R.C.S., F.R.A.C.S. .. 203
"Diabetic Coma: Principles of Treatment Based on Analyses of the Blood and Urine", by W. WILSON INGRAM, M.C., M.D., and G. V. RUDD, M.Sc. .. 204

REPORTS OF CASES—

"Buccal Carcinoma", by I. B. JOSE, M.S., F.R.C.S. 207
"Puerperal Insanity", by S. J. CANTOR, M.B., B.S. 208

REVIEWS—

A Text Book on Surgery .. 209
Asthma and Hay Fever .. 210

NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—

Progress in Medicine .. 210

LEADING ARTICLES— PAGE.

The Honorary Staff .. 211

CURRENT COMMENT—

Vitamins and Blood Coagulation .. 212

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—

Radiology .. 214
Physical Therapy .. 215

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific .. 216

CORRESPONDENCE—

Prostatectomy with Closure of the Bladder .. 218
Physics .. 219
Poliomyelitis .. 219

DIARY FOR THE MONTH .. 220

MEDICAL APPOINTMENTS .. 220

MEDICAL APPOINTMENTS VACANT, ETC. .. 220

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 220

EDITORIAL NOTICES .. 220

The Bancroft Memorial Lecture.[1]

By W. A. OSBORNE, M.B., D.Sc., F.A.C.S.,
Professor of Physiology, University of Melbourne.

MAN seeks immortality of his name where there can be objective reality, though many tenaciously hope that personality can also survive after death. To those who have deflected history or created a masterpiece in art, music or literature there is vouchsafed an immortality of renown. We are at last attaining that certainty of belief which commands us to revere as immortals those who are, by the greatness of their achievement, entitled to admission to the Pantheon of science. We thus honour, and posterity will continue to honour, Joseph Bancroft.

The purpose of this address is to make a survey of evolution and to point out how in every advance some good thing is lost or some new evil is acquired or new danger threatened. In some instances we may well express doubt whether the promotion, if so we may call it, has not been too dearly bought.

We are unfortunately in the possession of no evidence as to the manner in which life first appeared upon this earth. The remarkable chemical similarity between all plants and animals would lead us to hazard the belief that its arrival occurred at one particular time. Nor can we state anything as to the structure and vital reactions of primæval living things. The lowest forms of animal life which we are able to investigate are microscopical single-celled organisms. Eighty years ago such cells were described as specks of jelly, or minute sponges soaked in albumin, or tiny masses of protoplasm—a word that covered much ignorance. We know now that a cell is a complicated mechanism; more than this, an array of complicated mechanisms. In such a cell we may find an engine, the contractile cytoplasm, which transforms chemical energy into work, and with an efficiency which human skill has not yet

[1] Delivered in Brisbane on May 27, 1932.

been able to exceed. In such a cell we shall find a laboratory where, without fuss or noise, complex substances are built up, which the chemist is only beginning to comprehend. Some of these lowliest of living things have an apparatus for turning chemical energy into light, and with an efficiency far and away above anything yet invented by man. We shall find, too, in such humble types the entire mechanism for transmitting parental characters to offspring, for the production of complex chemical poisons, and for combating chemical poisons by chemical antidotes. It is also highly probable that these lowest forms of animal life are built after a pattern which makes the tragedy of death inevitable.

Lower than the animal, and obviously prior in time, is the plant. Our inquiry as to the most primitive form is complicated by the fact that the smallest living things, which are assumed to be plants, are parasitic and need the higher form of life for their maintenance. The lowest plants capable of independent existence are, like the lowly animals, single-celled individuals with an internal complexity equal to that of the animal; indeed, we might say superior.

If life arrived on our globe as a single-celled plant, it was already a most complex system. If, as we sometimes prefer to think, the single-celled plant was the outcome of millenniums of evolution, the lowest types have all been lost.

We are accustomed to look upon parasitism as something repugnant, and yet it was to parasitism that a very great advance was due. The living thing, to carry out the essential movements of life, must draw upon a store of energy. Every living thing is an energy transformer, and so we find in the whole vegetable kingdom, except in a few parasitic and saprophytic plants, that a very considerable portion of the living structure is compelled to function as an energy trap, the particular energy which is caught and stored being light.

It is surely a very remarkable fact that this should be the one and only form of incident energy which can be used. When the wind passes over a tall tree the forces at work in the lower part of the trunk are enormous, but they go to waste. The immense energy of moving water, as in waves, tides and waterfalls, is similarly unavailable. We are led to speculate that the most primitive form of life arose in stagnant pools where sunlight was the only energy at hand. The general attitude of a plant is passive; it holds out its energy trap in the shape of coloured leaf or frond for the daylight to strike. The energy of the light is then used to weld together the simple substances which the plant has abstracted from the air and soil into complex bodies of high potential energy, and these complex bodies, by breaking down again, can, when necessary, allow work of a varied kind to be carried out. But with the evolution of the animal a totally new type of living thing appeared. The animal found that instead of the tedious process of transforming and storing light energy, it paid better to rob the plant of its store; in fact, to eat the plant, energy store, energy trap and all. The animal is therefore a parasite on the vegetable kingdom, and by this parasitism it has gained its characteristic aggressiveness. The animal does not wait, as a rule, for its energy supply; it seeks it and gains it in a highly concentrated form, and its discharges of energy are correspondingly more massive and rapid. Nor has it to elaborate the complex constituents of its own structure; it acquires these from the plant practically preformed. In this change, as in every other, there is some faculty forfeited. The animal physiologist is inclined to look on the animal body as possessing chemical technique of a high order, and such it undoubtedly has; but the animal as a chemist, compared with the plant, is a veritable amateur. Give the plant a shovelful of loose molecules of such simple character as water, carbonic acid, and a few mineral salts, and it will proceed to build up, or synthesize, complex substances, such as albumen or the alkaloids, whose molecular architecture is a veritable nightmare to the organic chemist. The animal has lost by its parasitism the power of welding atomic groups together. This is particularly the case with those substances whose molecules are built on the pattern of an endless chain or ring—the well-known cyclic carbon compounds. Now these cyclic compounds are indispensable to the animal body; some are used for maintenance and repair, some as chemical messengers or hormones. Bereft of these, an animal, though plentifully supplied with all other constituents of food, cannot live. I am inclined to emphasize this difference between plants and animals, and have ventured to propose the terms "cyclopoietic" for the ring-building plant and "acyclopoietic" for the animal, helpless in this direction. We are familiar with the type of manufacturer who obtains parts and assembles them. An animal is therefore an assembler, and a realization of this fact helps us to understand the importance of the vitamins, about which so much fuss is made nowadays.

The next change to be mentioned is perhaps the most important of all. Hitherto, we may take it, the single-celled animal, when formed by parental subdivision, sailed away "on its own" and conducted a detached filibustering raid on the vegetable world, indifferent to, or possibly hostile towards, its equally unsympathetic parents, brothers or cousins. It did its own killing and eating and washing up. It swam along on a pseudopodial "shanks mare". It was a jack of all trades, a voluntary Robinson Crusoe. A time came, however, when the members of one family remained together and formed a colony with some subdivision of labour amongst its members. Some of the cells undertook exclusively motor duties and neglected other functions; these became eventually muscle cells. Others linked themselves into a signalling system and became nerve cells. Others specialized in manufacturing ferments and grouped themselves into glands, and so forth. The advantages of such a system of mutual aid are obvious. A cell that has, say, only contractile duties to carry out can perform these better than one that has a host of other tasks to conduct at the same

time. The colony could become more active, more aggressive and more efficient than was possible to the unit.

As was so ably pointed out by Herbert Spencer, we see a close analogy in the development of human society, and the advantages are similar. So, too, are the disadvantages. The more complex specialization is, the easier it is for the whole organization to suffer by the delinquency of a few. The danger is greater in the animal than in the plant, owing to the different form of government exercised over the units. A many-celled plant may be likened to a republic with universal franchise; an animal, and especially a higher animal, more closely resembles an empire or oligarchy, and here an injury to the seat of government or brain will kill or paralyse the whole body politic. This progressive centralization of government can be very clearly displayed in the evolutionary scale. In the cœlenterates it is most rudimentary. In the worms we meet the first instance of segmentation of the body; in fact we generally associate in our minds elongation of form and segmentation of body as characteristic of worms. In some types of worms the completeness of each segment is so pronounced that it is often a matter of difficulty in deciding whether the whole worm is not a family of segments instead of an individual. In reality the worm is a single individual, but it is built on a system of states or segments enjoying considerable autonomy, but knit into a successful federation. One great advantage of segmentation seems to be the facility it affords for repair after injury. If a worm be cut in two, the head end can grow a new body and the tail end can grow a new head.

With advancing centralization of government goes diminishing power of replacing lost parts. A crayfish can grow a new claw, but the human being cannot grow a new finger. The limited power of repair in the human body is a recurring tragedy of surgery. The skin and its appendages, some mucous membranes, bone, cartilage and kindred connective tissue, blood and the peripheral nerves can be repaired by natural processes if the injury is not too extensive; but the absence of any such healing process in the enamel of tooth has been provocative of much ingenuity in the dental profession, whilst the permanence of any loss in the central nervous system is one of the saddest facts in medical science.

Comparatively early in vertebrate evolution we find the invention of bone, that strange tissue with its concentric tubes and interlocking arches so admirably suited for resisting stress and impact. Here we may note an important chemical change. Hitherto crystalline, and therefore brittle, carbonate of lime was employed for conferring rigidity. The vertebrate has resorted to the much superior phosphate of lime, non-crystalline and elastic. But this advance has been bought at a price. Calcium carbonate is abundant, whereas phosphorus in a form available for life is a rare element. The plant has some difficulty in getting its supplies, particularly in Australia, where the soil is poor in this essential ingredient. How important phosphate is even for plant life is shown by many facts, such as the withdrawal of all phosphate from the leaves of deciduous trees before these are allowed to fall. The vertebrate has not only to secure sufficient phosphate for its living cells, but exceptionally large demands are created by bone. Here, too, owing to the transformation of resilient colloid into brittle crystal, a danger well known to engineers, bone, unlike cartilage, has to be supplied with blood vessels, and we find calcium phosphate being continually discarded and fresh laid on. In Australia we have to import thousands of tons of phosphate yearly to prevent our lands becoming unproductive of wheat, oats and fodder grass, and this phosphate was all gathered together in far-off times by animal life.

The next important advance was certainly one of the most romantic. This was the great farewell to the sea. Already there had been premonitions of the change. Some fish, like the carp, began to augment the oxygen supply by swallowing occasional mouthfuls of air; then, away back in old Devonian times, we find the mud fish (still lurking in Queensland rivers), which began to supplement the gill-supplied oxygen with air admitted to the swim-bladder. Already many animals, such as the insects, had discovered the benefits of terrestrial life, but we humans are more directly interested in the Columbus-like adventure of the higher fish. The advantages of life on land may be given briefly as follows: First and most important, the available oxygen is very much greater and the necessary supply obtained with less effort. As evolution advanced, bodily activity increased and the low oxygen content of water became, therefore, a serious obstacle to further progress. As a second advantage may be named the greater scope that life on land gave the distance receptors. Sounds could play a greater part in the identification of surrounding movements, and the eye could have a wider and clearer range of vision through the air. But with the change from water to air came an entirely new set of mechanical problems to be solved. The fish had already mastered the varied and profoundly difficult questions in physics which beset a mechanism immersed in a liquid. It could alter its depth, and therefore be subjected to varying hydrostatic pressures; it could move swiftly without deviation from a straight line and without rotation of the body on its long axis. But these engineering devices of stream-lined body shape, swim-bladder and fin were of no possible use on land, and so they were abandoned. The animal on land, incapable of aeroplanic flight, developed systems of levers or limbs by which the body could be jerked from place to place. The lever system we cannot frankly regard as a success. The waste of energy is absurdly great. Nature, as Mr. H. G. Wells remarks, never has risen to inventing the wheel, possibly, we may add, because the difficulties of bringing in blood and nerve by the axle were insurmountable. However, this lever system was apparently the best that could be done

at the time, and for some reason, perhaps a conservative adherence to some later fish types, the limbs were arranged in two pairs, a plan which dominated the body of all succeeding stages.

When we think of it, the action of gravity must have been a most troublesome reality, as, indeed, it is yet. To us humans who missed the line of descent that produced the birds and bats, and to all the creeping things like us, movement of the body even a few feet against gravity is a severe tax on our muscular and circulatory organs. Moreover, a fall of a few feet, even a fall from our natural supports, may produce a serious injury—so great is the gravity pull. Gravity had, further, another action which had to be counteracted, and this was the tendency of the blood to sag to the most dependent parts of the body. To meet this difficulty the heart and arteries had to be strengthened, and a high blood pressure had to be maintained, so that each region of the body could be flooded with blood when necessary, and irrespective of its vertical position. Thus in the larger animals a great strain was thrown on the circulatory as well as the muscular organs, and new dangers, never completely got rid of, were added to life. The high blood pressure which removes so many good citizens is an outcome of the change from the sea to the land. Other disadvantages of the new *régime* were that the air-breather, having burned his boats, or, rather, given up his gills, was, for some considerable time at least, debarred from exploring the greater part of the earth's surface, and was subjected to almost continual danger of drowning. He was also exposed to greater extremes of temperature than had been experienced in marine or river life, and was beset by new perils of storm, hail and rain, falls from heights, things falling on him, thirst, dust, frost and fire.

We now come to a great forward step which ushered in the bird and mammal. This was the evolution of an automatic mechanism which regulated the temperature of the body, and kept it constant within fairly narrow limits. The popular terms warm-blooded and cold-blooded are misleading, for frequently a so-called cold-blooded animal, such as a bee, may be warmer than a mammal or a bird. The essential difference is that in the animals hitherto developed the body temperature varied directly with the temperature of the surroundings. The activity of an animal was dependent on the temperature of its environment; on a cold day it was sluggish, and only on a warm day could it be active. In the mammal and bird we find a device which maintains the body temperature fairly constant, irrespective of ordinary atmospheric variations and body activity. In man in health the diurnal variation is about one degree centigrade. In consequence the warm-blooded, or, as we prefer to call it, the constant-temperature or homoiothermal animal had its geographical frontiers enormously enlarged, and was able to spread from the equator to within a few degrees of either pole. The high development of this thermostatic mechanism which we find in ourselves was not obtained at one bound; we see it imperfectly developed in the echidna, and not fully efficient in the hibernating mammal. The body temperature of the warm-blooded or homoiothermal animal lies close to 40° C., and the choice of this temperature may have been dictated either by the original tropic home or by the fact that the ferments of the body have an optimum temperature—that is, a temperature at which they act most rapidly—close to 40° C.

The adoption of a standard temperature brought about an anatomical change. Hitherto animals used their limbs for progression, but rested the body on the ground. As the ground in most parts of the earth is too moist and too cold for prolonged contact (in certain deserts the ground is far too hot) the body was lifted up on the limbs and so could be swathed with fur or feather and shielded from undue extraction of heat. This meant that the limbs were used for support as well as progression, and so we find in ourselves that a large proportion of muscular work is expended in the mere effort of maintaining posture. The adoption of a more complex posture made necessary a number of changes in the central nervous system, particularly the cerebellum.

The fact that most of the muscular activity of our legs is used in support and not progression explains the advantage of the bicycle; here support is obtained by a wheel system whilst the legs can be employed on progression alone, and so man can attain a speed comparable with that of the quadruped.

In man this device for maintaining constancy of temperature has reached its highest degree of efficiency, the only other creature which can be compared with him being the horse. This has meant in man not only a liberal distribution of sweat glands, which can pour liquid perspiration on the skin surface, but a high content of water, called scientifically imbibition gel water, in the skin substance. The tortuous duct of the sweat gland has as its *raison d'être* the upkeep of imbibition water in the skin. Copious perspiration has the disadvantage of robbing the blood of considerable sodium chloride or common salt. This in some parts of the world, like the polar regions and central Africa, can become serious. A disadvantage of the high content of gel imbibition water is that the skin will lose heat when the air is dry, even if it be also cold, when it is against the interests of the skin and body generally to lose any extra heat. This accounts for the proverbial unpopularity of east winds in north-west Europe.

But the change which more than any other made man possible was the assumption of the erect posture. For the possible cause of this and for its reaction on man's anatomy I would refer you to the writings of my colleague and immediate predecessor in this lectureship, Professor Wood Jones. The chief advantage in this change is that on the assumption of the erect posture the fore or upper limbs could be reserved for skilled movement. In

the ape the prehensile hand, endowed with the finer sense of touch, had arrived, but it was frequently called upon to support the body and was always in action when the animal moved from place to place. But in man the hand was placed unreservedly at the bidding of the thinking brain. Herbert Spencer has clearly pointed out that mental subtlety and body dexterity run parallel and with reciprocal action in the animal series. Despite the literary skill of Swift, we cannot picture to ourselves an inventive houyhnhnm.

A further advantage was this, that as the upper limbs were no longer used for support, the thorax or chest was no longer subjected to the same varying pressures and impacts when the animal moved. In consequence, the voice could be rendered more flexible, and its intensity, pitch and timbre more under control. Hence language as a vehicle of expression could come into existence. The superiority of sound signals to gestural ones is obvious; sounds can be heard in all illuminations and without any special directive attitude of the receptors. They fall short, though, in the distance through which they can be transmitted.

Another great advantage was that the eyes, being elevated, could have a wider range of perception. Hence in man we find the eye superior in its mechanism of accommodation to that of any other mammal.

But these evolutionary benefits have been very dearly bought, for the assumption of the erect posture brought with it certain grave disadvantages which time has not yet completely cured. In the erect position the action of gravity on the circulation is accentuated, the heart is subjected to a greater strain, and the head, being the uppermost portion of the body, is constantly liable to extensive alterations in its blood supply. Man is the only animal subject to that functional anæmia of the brain which causes fainting. Some lower mammals can be made to faint by holding them in a vertical position which would never be assumed by the animal for any length of time in its normal life. In man certain nervous and circulatory adjustments have been made to combat this disadvantage, but the mechanism is very easily deranged. We find, too, in man, and for the same reason, a greater liability for the blood to stagnate under pressure in the lower limbs.

Another disadvantage is that in the alimentary canal the food mass which, were man a quadruped, would be propelled almost in a horizontal plane, is compelled in one portion, namely, the ascending colon, to move against gravity. To this we may largely ascribe the fact that the region of the appendix is one of the most vulnerable portions of the whole alimentary tube. A further disadvantage is to be found in the undue pressure to which the pelvic viscera are subjected, a disadvantage which has brought upon us a long train of ailments. In the familiar quadrupeds, such as horse and cow, one cannot fail to observe that the heavy contents of the abdominal cavity are slung on a hammock of skin and muscle, whilst the pelvis is immune from pressure, or, indeed, may have a slight negative pressure. How different is the human being, where the lower pelvic organs are subject to continuous compression, except when the body is recumbent. Many of the gynæcologist's activities find their cause in this fact. It is also the cause of the commoner forms of hernia or rupture.

Another important disadvantage was that progression had to be entirely relearned. In all the limbed vertebrates up to this point progression on four limbs had followed a fairly fixed and definite system, and the nerve centres in the spinal cord and brain stem were so adjusted that the act could be carried out instinctively and automatically. But with the assumption of the erect posture all this nerve mechanism had not only to be ignored, but resisted, and the new method laboriously acquired. In the lower mammals removal of that part of the forebrain which is concerned with skilled movements, the so-called motor or Rolandic area, is followed by a very shallow and temporary derangement of progression. But loss of the same area in the human being may bring about total loss of voluntary movement in the lower as well as in the upper limbs. In a word, walking, running *et cetera* are still skilled movements. We see this in the time taken by the human child to learn to walk with certainty and without the exercise of attention on the movement. We note also in the same connexion that man by the change has lost, and will never again acquire, the power of instinctive swimming.

By the elevation of the head the sense of smell lost much of its significance and sensitiveness, as it could no longer be used with ease in tracking the path of enemy or mate. Fortunately vision, as has been stated, underwent a compensating improvement, both in power of focusing and by the device of swivelling both eyes on the same object, giving stereoscopic vision and a finer perception of distance, though the field of vision was greatly reduced by the latter. As greater difficulty is encountered in keeping the centre of gravity above the base of support, finer adjustments of the nervous system became necessary. Marvellous as these are, they are not perfect, and stumbling occurs more often in the human than in any other animal. Another and a grave disability is the great reduction of speed of progression which the biped condition imposes. Man is outclassed in pace by quadrupeds so small in size as the rabbit, hare and fox-terrier, not to speak of the larger beasts whose rate of progression is almost of a different order of magnitude. We see, therefore, that the upright posture which made *Homo sapiens* possible has been bought at a great price.

I turn now to the same principle visible in human society. I have already mentioned that advancing specialization of society must of necessity present us with the danger that the delinquency of a few will involve all other units, no matter how faultless these may be.

One of the great antagonisms in history was that between the agriculturist and the hunter. The hunter, by virtue of the qualities that brought success in his efforts, was a better warrior than the agriculturist, who won the fight eventually by superior numbers and organization. But it can hardly be doubted that as a physical specimen of manhood the hunter was a superior animal. We look upon slavery with abhorrence, but could Greece have led the world to this day in culture if her aristocracy had not been exempt from menial tasks? The abolition of slavery brought about the economic downfall of the West Indian islands, and in the sixties of last century was certainly not an unmixed blessing in the United States of America. We all look to the day when war will cease to be the great arbitrament amongst nations, when costly and menacing armaments will no longer be such a burden on citizens of civilized countries, but to deny that war has been of service or that the abolition of war might be attended with grave dangers would be exceedingly foolish. A cultured American once said to me: "The two greatest events in our history were the breakaway from England in the eighteenth century and the consolidation of the Union in the nineteenth; neither of these could have been effected without war. And you", he went on to say, "do you honestly think you could have destroyed the tyranny of the Stuarts and abolished torture and Star Chamber methods and brought in the *Habeas Corpus* and other fundamentals of liberty if Oliver Cromwell had not drawn the sword?" I could think of no answer. Much as we deplore the cost in blood and treasure, and the awful aftermath in certain moral aspects, as well as in economic disaster, let us not forget that wars are won by masculinity and loyalty, endurance and courage, whereas in the absence of this test those who come to the top may do so by cunning, and altogether too much power may be acquired by plausibility and finesse.

The practice of duelling we rightly look upon with disgust and contempt, but let us remember that the decline of duelling meant the decline of dignity and honour in debate. The modern politician who tries to discredit his opponent by attacks and innuendoes devoid of any foundation, the barrister who today grossly abuses the privileges of the courts and tries to win his case by blackening the character of his opponent's witnesses, would in the old days be obliged to answer for his conduct on a cold morning with pistol or rapier or, as is more likely, since he was not sufficiently well bred to be called out, be given a salutary horse-whipping.

At the present time we are taking stock of democratic government, and many are wondering if the price has not been too high. In this age, too, opinion is in a state of rapid change as regards matters dealing with sex. Without doubt the evils due to sex ignorance will be removed, but I can see that the price may well be the loss of the mystery and romance which have been such great factors in literature and conduct since the days of the first troubadours, as also the decline of the shame instinct which has in the past made for decency.

The unrest which threatens to bring India into anarchy is largely due to a widening of education introduced with the loftiest of motives and usually regarded as wholly beneficial.

Our cities are being lit at night with higher and higher candle-power lamps, and a diminution in crime and street accidents may be expected, but we are hiding the stars from our eyes. I recently travelled from the Pacific to the Atlantic Ocean, from city to city, through the United States of America, and only on one night did I see the splendour of the starry sky. What a loss to our spiritual life! Standardization may cheapen luxuries and necessities, but standardization is the enemy of true art, and possibly may be the enemy of health. A room artificially heated by methods pursued in America is uniform in temperature, but it is not giving that diversity which the nervous system requires. An artificial language might promote goodwill amongst nations and help to diffuse knowledge, but it would kill poetry. The dysgenic action of modern preventive medicine has been pointed out again and again. Western civilization has been imposed on races lower in the scale by missionaries with honour as well as zeal, but many critics, not necessarily biased against such action, have declared that the results are disastrous. I could give many more instances, but will be content with these few.

A survey of evolution and a survey of history teach the same lesson. To expect a reform to be unaccompanied by ill-effects is an idle dream. Too often a hair divides the good from the bad, whilst it is possible that a so-called reform, devised in all good faith, may actually be weighted heavier on the side of evil.

PREVENTION OF CANCER OF THE SKIN AND BUCCAL CAVITY.[1]

By E. H. MOLESWORTH, M.D. (Sydney),
Lecturer in Dermatology, The University of Sydney; Honorary Dermatologist, Royal Prince Alfred Hospital, Sydney.

Cancer of the Skin.

AT this stage it is not necessary to repeat the arguments and array the facts which go to show that the great disproportion in the incidence of skin cancer in Australia as compared with England is due to an ionization effect by the ultra-violet component of our abundant sunshine. I assume that it is generally accepted, in Australia at least, that chronic irritation by ultra-violet rays, as by X rays, can produce cancer. But this is not to be taken to mean that all cases of basal and squamous carcinoma of the skin occurring in Australia are held to be due to chronic sunburn irritation. We are

[1] Read at the Third Cancer Conference, Canberra, March, 1932.

often quite unable to guess what are the causes of those tumours which arise on covered parts or in persons who have not been exposed to chronic sunburn. Some of them seem to arise spontaneously, perhaps from cell rests, some as a development of malignant activity and as a result of chronic irritation in simple tumours like seborrhœic warts, some in scars from burns or other injuries. In other countries occupational cancers from irritation by tar, lubricating oil, soot and paraffin undoubtedly occur, but I have never been able to identify any of such influences as a cause in any case of cancer of the skin in Australia. In any event, these occurrences are so rare in Australia as to make measures of prevention along such lines of little value as a means of effecting a diminution of cancer of the skin in this country.

Single acts of trauma are frequently blamed by the patients as causative agencies in the production of their tumours, and this contention is not infrequently supported by their medical attendants, either to avoid argument or because of a lack of appreciation of the value of physical signs in the form of coexisting epitheliomatous or pre-epitheliomatous lesions such as keratoses. The scratch of a pin, the prick with a rose thorn, the blow with a cricket ball, so dear to the heart of the patient whose mind must provide itself with an explanation for the disaster, unsatisfying though the explanation may be to a critical examiner, are, to my mind, only to be credited at most with a precipitating effect. Never yet have I seen a case in which such a cause was blamed and in which there was not ample evidence in the shape of chronic sunburn effects, or even other developed epitheliomata, to make it almost certain that the trauma resulted in tearing off a keratotic lesion, thereby stirring up into immediate activity the already existing small epithelioma underneath the horny cap. Moreover, even if, for the sake of argument, we allow trauma a share in the commencement of cancer of the skin, it is obvious that it is impossible to prevent such occurrences as scratches and blows, and that effort in such a field would not diminish the incidence of cancer of the skin to any calculable extent.

Thus we are bound to consider whether a campaign directed toward protection from unnecessary sunburn will not provide a notable diminution in the number of cases of this kind.

In my opinion, a sustained course of instruction of the public and of medical men promises a very definite result in this direction.

It must be remembered that certain types of skin are those which particularly predispose to the effects of chronic sunburn. These types are the fair, and more particularly the red-haired or sandy-haired individuals. A skin which shows its inability to provide an even curtain of brown pigmentation to protect itself and which under stimulation can only provide isolated outposts of pigment in the form of freckles, is that which will certainly develop cancer if exposed for thirty or forty years to abundant sunlight. Such exposure is inevitable if the occupation is an outdoor one, especially farming and pastoral work, and if no attempt is made to provide outdoor workers with more shade than is available to them at present.

At this stage it is perhaps advisable to comment upon the modern habit of going about without a hat in a climate like that of Australia. The old fear of sunstroke has been shed, and rightly so; but if that risk has been shown to be imaginary, it by no means follows that all fears of damage by too much sunlight are equally baseless. On the contrary, while the beneficial effect of sunlight and ultra-violet rays is admitted by all, it also holds good that such agencies can be abused. As I mentioned in a previous publication, there is no good thing in which over-indulgence is not harmful. Food and drink, work and play, can all be overdone and thereby result in disease and death. So also can disease and death result from over-exposure to sunlight and ultra-violet rays. The hatless brigade undoubtedly courts the results of this over-exposure. Fortunately this cult does not extend beyond the cities to any real extent, at least at present, but the dangers of it should be impressed upon the community. It is often put forward that, as cancer of the skin does not occur in youth, exposure without a hat does not matter for boys. This, I am convinced, is bad teaching, since it is more than probable that cancer of the skin is the result of the sum total of chronic sunburnings from childhood up, and not of single or widely separated severe exposures. I question the wisdom of prescribing a shadeless cap as compulsory wear for boys attending particular schools, especially in summer, and if their subsequent vocation is going to be an outdoor one. One often sees on the beaches boys and even girls with a skin sprinkled with freckles engaged in the hopeless attempt to accustom themselves to sunburn and develop the fashionable bronzed appearance of other frequenters of the beach. One feels tempted to paraphrase the biblical axiom and say: "The red-haired youth cannot change his freckles for the black of the Ethiopian's skin." I have seen multiple rodents in a youth of twenty with red hair and freckled skin.

The Education Department of New South Wales recently issued to teachers some instruction on this point, and it would be valuable to extend this practice so as to reach the pupils of all schools, State, public and private, in order that all might learn in their youth the dangers of overdoing exposure to the sun, as well as the benefits of outdoor habits.

It should be taught that the practice of going about in sunny weather without a hat is harmful, especially to fair-skinned people, even in youth, and that school caps providing no shade are unsuitable for summer wear.

In adult life, and even in occupations of the farming and pastoral variety, a great deal of avoidable exposure is undergone by many people. The country man usually wears a hat affording little or no more shade to his face than that worn by the city dweller and indoor worker. A hat with a much

wider brim, like that of the sombrero, should be provided by the hat manufacturer, and could be advertised by them if recommended by some such body as this as suitable for men occupied in outdoor pursuits. It might be described as absolutely essential if the wearer is fair skinned or freckled. Such persons should also be taught to ride or drive with sleeves down and hands protected by some sort of mitten or gauntlet whenever possible.

Measures like this would certainly diminish the incidence of skin cancer in Australia, and I propose that they be recommended by this conference and that the best means of promulgating them be discussed. Another important aspect of prevention of cancer of the skin is that of instruction of medical students and practitioners and men of the general public that horny accumulations on the skin, such as keratoses on the exposed parts, are forerunners of cancer, if not already developed epitheliomata. Having cut hundreds of these lesions and examined them in serial section, I can state with certainty that many of them, and indeed all that display infiltration at the base, are already definitely epitheliomatous, though they are often regarded merely as precancerous lesions. It is gratifying to find that many, especially among the younger practitioners, recognize this fact and recommend treatment in this stage, but still all too many cases are allowed to pass over the borderline. It is astonishing at times to read a letter from an experienced practitioner presented by a patient. The patient has obvious tumours, sometimes even ulcerated, but the practitioner asks for the treatment of "pre-rodent" lesions. It is also depressing to hear from a patient with a large and dangerous epithelioma that six or twelve months before he had been told that the unulcerated lump or scaly wart then present was not important and did not need treatment.

The disease in the keratotic stage is so easy to cure and the dangers of procrastination are so great that all practitioners, especially in country districts, should be made to realize that it is in the pre-epitheliomatous stage that the disease is best attacked, and that it is necessary for them to urge upon all such patients the necessity of playing for safety by having these lesions treated at once.

It is in this field that radiation produces its best effects, since, with good technique, a complete cure can be achieved at little expense and with very little inconvenience to the patient. Perhaps the conference would be willing to issue an authoritative warning as to the risks of leaving such lesions and recommendation to all practitioners and to the public to the effect that pre-cancerous keratoses should be treated while in that stage.

Cancer of the Lip.

I do not wish to seem to obtrude my own ideas too much upon such a conference as this, but I want all to examine any cancer of the lip they may see in the future, with a view to deciding whether smoking or sunburning is the more likely cause. It is very hard to eradicate old beliefs, but belief in smoking as a cause of cancer of the lip is losing ground rapidly. It used to be thought that the old clay pipe smoked by the labourer was the reason why labourers suffered so much more from cancer of the lip than others. It has been pointed out that those occupations in which smoking is permitted produce a large proportion of cases of cancer of the lip, and that those like coal-mining and a number of others produce very few. This came from the Medical Research Council in England about 1927. The Medical Research Council enumerated the trades that predisposed to cancer of the lip and those that did not. All the predisposing occupations were outdoor and all the others were indoor. Yet the indoor tradesmen and miners smoke when off work. The old clay pipe is almost unknown in this country, even among the poorest, yet the incidence of cancer of the lip is as great as ever. The vulcanite stem of the modern pipe is neither hot nor rough, and many men smoke almost continually in their offices, but never get cancer of the lip unless their hobbies or pastimes expose them a lot to sunburn. Many women smoke almost as much as men nowadays, but cancer of the lip in women is still a great rarity. But most significant is that when such a growth occurs in a woman's lip it is invariably found that she is an individual who has been exposed for years to sunburn. Dr. Sandes will remember a schoolmistress with an epithelioma of the lip whom I passed over to him for treatment. She was a woman of thirty-five or so; she had never smoked, but she was a much sunburned, freckled person who had been fond of outdoor sport, and for years had sunbaked regularly on the beach near the school at which she taught at Bondi.

You will also probably recall the flat keratosis that nearly always precedes the developed epithelioma of the lip, just as it precedes epithelioma of the skin. Irritation from the stem of a pipe, or other trauma, such as tearing off the horny collection, might conceivably precipitate the growth, but does not, in my experience, cause it. Smoke only touches the outer part of the lip on leaving the mouth, by which time it is cooled and has deposited nearly all its distillates. Finally, if early cases are examined with this in mind, it will be found that it is always on the exposed parts of the mucous membrane and hardly ever on the internal surface of the lip that the growth commences. The mucous membrane of the upper lip practically never provides a growth. The sunburn theory provides a satisfactory explanation of this, because the upper lip is much better shaded than the lower.

Therefore, it seems desirable that the danger of cancer of the lip should be pointed out as also due to sunburn, and should be included in the warning against unnecessary sunburn and in the recommendation that a shady hat should be worn. In persons who tend to get sunburned lips, if their occupation be an outdoor one, a moustache sufficient to shade the lip might be recommended. The doctrine that cancer of the lip is due to smoking has not prevented

men from smoking pipes, or prevented men who do not smoke from developing the growth. I suggest, therefore, that a trial of this new doctrine be made and that it be brought to the notice of all outdoor workers that cancer in this region is in many cases demonstrably associated with much sunburn. Then the recommendation for better shading by bigger hats will carry more weight.

Even more than in the case of cancer of the skin should the pre-epitheliomatous keratosis on the lip be immediately treated by radiation, when a rapid and complete cure can be achieved with proper technique at little expense and without resultant deformity.

It is necessary to distinguish the common split lip, such as occurs in winter, from the fissure in a keratotic patch which lasts irrespective of weather. The former is not of any real importance as predisposing to cancer, but the latter is ominous.

Cancer of the Buccal Cavity.

In regard to cancer of the mouth, one does not feel so sure of the innocence of tobacco smoke. The jet of smoke drawn into the mouth from pipe, cigar or cigarette impinges upon the tongue and palate. The tip of the tongue comes into contact with the opening of the stem of a pipe or with the butt of cigar or cigarette. Distillation products with possible carcinogenic properties comparable with those of tar are probably deposited upon the mucous membrane. And it must be admitted that men who have not had syphilis sometimes develop leukoplakia in the mouth. This seems to occur much more commonly in cigar smokers than in others. Though in my experience tobacco leukoplakia is much less likely to become carcinomatous than syphilitic leukoplakia, it cannot be given a reputation entirely untarnished in this respect.

Rough teeth and chronic inflammatory septic conditions certainly seem to be the accompaniment of a considerable proportion of cancers of the mouth. Ill-fitting dentures may also be suspect in some cases.

But by far the most important factor in the determination of cancer in the mouth, in my opinion, is late syphilis. The remarkable frequence with which late syphilitic leukoplakia, superficial and interstitial glossitis and similar manifestations are seen in mouths which are the seat of cancer, cannot help but be part of the experience of everyone. Somewhere between 20% and 30% of all persons with cancer of the mouth yield a positive result to a Wassermann or Kahn test. And we must remember that by no means all patients with syphilis in a late stage like this show a positive result to these tests. Sometimes even a patient with obvious syphilitic leukoplakia fails to yield a reaction. Taking this into consideration, it will be seen that syphilis is a very significant accompaniment of a very important proportion of mouth cancer and must be regarded as a most dangerous predisposing influence.

In support of this is the finding by statistical inquiry published at the last conference by Dr. Holmes, to the effect that cancer of the mouth is the only form of cancer that is diminishing in frequence. It is possible to explain this by the increased efficiency of the treatment of syphilis in early stages, whereby a much larger proportion of these sufferers are cured by the better drugs and better organization available today as compared with twenty-five years ago.

In addition, then, to preaching that rough and decayed teeth should be removed and that chronic inflammation and septic infection in the mouth must be prevented or eradicated, it would appear desirable to concentrate still more upon the early and efficient treatment of syphilis. It might be possible, through the organizations existing to combat syphilis, to put before sufferers from this disease a further inducement to persist in efficient treatment by warning them that failure to do so undoubtedly exposes them to the additional danger of the horrible form that is assumed by cancer of the mouth.

Summary.

1. *Cancer of Skin and Lip.*—It would seem desirable to publish through educational institutions that undue exposure to sunburn is damaging, even in youth; and by other channels that in order to prevent cancer of the skin, hats should always be worn in outdoor occupations and pastimes, and that a hat with a much wider brim than the ordinary town variety should be worn by men in farming and pastoral pursuits.

2. *In Cancer of the Mouth.*—(*a*) Measures should be taken still further to improve the facilities and efficiency of treatment of syphilis in early stages. By this means it should be possible to insure a still larger proportion of cures in this disease, which undoubtedly seems to predispose to cancer of the mouth. (*b*) Measures of mouth hygiene should also be taught to the public, since rough teeth and inflammatory conditions in the mouth seem to predispose to cancer of the mouth. (*c*) A campaign against smoking is obviously futile, but even if possible, the benefits to be looked for are problematical.

REMARKS UPON THE TREATMENT OF BUCCAL CANCER.[1]

By L. M. McKILLOP, M.B., Ch.M. (Sydney), F.R.C.S. (Edinburgh), F.R.A.C.S.,

Chairman of the Treatment Committee of the Queensland Cancer Trust; Honorary Surgeon, Mater Misericordiæ Hospital, Brisbane.

THE object of this short paper is to promote a discussion upon the general principles involved in the modern treatment of cancer within the mouth cavity, including the lip.

It can safely be said that in no part of the body has the type of treatment been so profoundly

[1] Read at the Third Cancer Conference, Canberra, March, 1932.

influenced by radium as in oral cancer. Prior to the discovery in 1898 of radium, and for many years subsequent to that date, in fact until about 1925, surgical excision, where practicable, was the method of choice for cancer within this cavity. Difficulties and doubts regarding filtration and dosage prevented for years the full employment of radium as a therapeutic measure in cancer of the mouth. As screenage has improved in the direction of cutting out the β rays by the use of slightly thicker platinum containers, and as we have learned more and more about secondary radiation thrown off from screens and from tissues themselves, increasing use has been made of radium. During the past three or four years the use of radium has undergone a still further refinement by the employment of radon seeds, which contain no β radiation, thereby largely eliminating the danger of necrosis of the jaws, which had previously been a bugbear of radium treatment within the mouth. As the clinic with which I am connected in Brisbane and in which, with Dr. B. L. W. Clarke, I share the radium work, has not been in operation long enough to allow me to speak of cures, except from the clinical point of view, I do not intend to have recourse to figures in dealing with the results for the immediate present, but rather to refer to general principles.

Epithelioma of the Lip.

Epithelioma of the lip is extremely common with us. The tendency for spread is to the skin and not so much to the mucosal aspect, and there is a great variation in type of growth, situation and degree of malignancy. While some epitheliomata begin in a leukoplakic patch, others have their origin in a fissure or an area of sunburn. Some cancers of the lip for months and very occasionally for years appear to make little or no headway and scarcely infect the drainage glands. Others again grow rapidly and exuberantly and cause early metastases, not only in the submental and submaxillary glands, but in the carotid group as well. In some cases the swelling of the glands is purely inflammatory; in others the glands, while infected with cancer, remain small and, in a fat neck, are difficult to palpate. For these reasons of variability and doubt I consider that radical surgery is the best treatment for cancer of the lip. In an early case it is almost impossible to be certain whether the glands are infected. The surest way is to examine by frozen section a snipping from the edge of the growth to ascertain the type classification. If the growth belongs to Group II, III or IV of Broder's classification, a long collar incision at the level of the thyreo-hyoid membrane is made across the neck, and through this the glands are cleared out from the triangle. A strip of lip, including the growth and a safe margin of healthy lip on each side, are then removed down to the collar incision in one block. If the pathologist reports infection of more than the submental glands, a Columbia paste collar of radium needles should be worn around the neck for about 7,000 to 10,000 milligramme-hours, but this collar should not be applied for about three weeks after the wound has healed. Where there are masses of inoperable glands in the neck I believe better palliation is secured if deep X ray therapy is accurately given than if radium is used. However, during the past few months I have used radon seeds in grossly involved glands in the neck, but it is too early to speak of the results. In the event of there being found operable glands in the carotid group, there should be no hesitation in cutting across or removing one or both sterno-mastoid muscles to gain full exposure. Later on, heavy radiation should be applied to the neck. No surgeon should allow himself to become disheartened by the appearance of freshly infected glands necessitating repeated operations, unless ulceration and fungation occur, when only radium and deep X ray therapy can be of any use. If an epithelioma of the lip is seen in the really premalignant stage, excision of the patch is not necessary. A five or ten milligramme plate applied with lead screenage to protect the upper lip and surrounding parts should be applied for some hours. This will usually suffice to clear up the condition.

Before beginning an operation for clearing out the glands of the neck, I have for some time past been in the habit of injecting a large quantity of 0·5% aqueous solution of adrocaine or of normal saline solution into the fascial planes of the neck. When the incision is made and the triangles are opened up, the glands can be distinctly identified through the fluid which has infiltrated the tissues, and their identification and removal are greatly facilitated. I have also demonstrated the great asistance this manœuvre is in clearing out the axilla.

Cancer within the mouth cavity proper is of great importance for several reasons. First, it is often extremely malignant; secondly, it is often in its incipient stage neglected by the sufferer, who may come only in the advanced stages; and thirdly, it is largely a preventible form of cancer. Moreover, it is, as far as our experience goes, fairly common, and never begins in a really clean mouth, except in one variety—that caused by the direct irritation of a rough tooth or a dental plate—and then only occasionally. It is usually an epithelioma, or rarely a sarcoma, as in post-nasal sarcoma and lympho-sarcoma of the tonsil. The sites most usually attacked are the tongue, the floor of the mouth, the mucosal lining of the cheek, the tonsil, and occasionally the roof of the mouth. It appears to be definitely associated with three ætiological factors—oral sepsis, syphilis, and excessive tobacco smoking or chewing—which operate in a given case, singly or in combination.

Cancer of the Tongue.

Cancer of the tongue may begin posteriorly near one faucial pillar, where its presence is usually not complained of until it is well advanced, or it may begin on the dorsum of the anterior half or along the lateral border. It usually finds its origin in a

patch of leukoplakia of long standing, induced by excessive smoking (smoker's patch) or syphilis (syphilitic leukoplakia) or in a fissure or ulcer caused by the rubbing of the sharp edge of a tooth or ridge of a dental plate. Whatever the cause and wherever the site, the disease quickly advances and, peculiar to state, the lymph glands on the healthy side may become involved as early as those on the side of the growth. The latter will soon present the appearance of a deep fissure with infiltrated base and fixation of the organ, or of a raised, irregular, cauliflower-like mass.

Radical operation is no longer the treatment of choice for cancer of the tongue. The operation, even in skilled hands, is attended by a high death rate from shock, hæmorrhage and septic pneumonia, to say nothing of the mutilation, deprivation of speech and interference with mastication and swallowing. Radium has definitely usurped the place of the knife and thermo-cautery, to the advantage of patient and surgeon alike. For an ordinary case the implantation of about five to nine one-milligramme needles, screened by 0·5 or 0·6 millimetre of platinum and left *in situ* for about seven days, has frequently resulted within twelve to sixteen days in the complete disappearance of the growth and an apparent clinical cure. It has been our practice at the Mater Misericordiæ clinic in Brisbane to stitch the needles in and then to bring all the threads directly out through the cheek just in front of the masseter muscle, thus avoiding the use of a rubber tube in the angle of the mouth. Latterly, however, we have begun using radon seeds, employing about twelve millicuries for each average case. We consider the seeds superior to the needles, as they are easily implanted and cause less annoyance to the patient, and the clinical results appear to be just as good. As the result of the use of radium needles or emanation the sufferer is quickly freed of his pain and salivation, the tongue becomes mobile, and he is not exposed to the risk of inhalation pneumonia, shock and hæmorrhage, and his stay in hospital and away from his work is greatly lessened.

Before using radium in either form in cancer of the tongue or in any malignant condition in the mouth, it is absolutely essential to have all pyorrhœal teeth removed and the mouth cavity rendered as surgically clean as possible. The importance of this is related to the danger of late necrosis of the alveolus and jaw, which may eventuate even years after irradiation as the result of the extraction of a tooth or other slight trauma within the mouth. Another very important point to remember is that when any malignant condition within the mouth is discovered, neither radium nor deep X ray therapy should be applied to the neck glands, nor should surgical excision be attempted until at least two or three weeks after radiation has been applied to the primary growth. There are two reasons for this: (i) As Cade and Souttar point out, the reaction in the involved tissues, which is essential to obviate the later danger of postponed necrosis, depends upon an adequate lymph and blood supply being available to the neighbourhood of the growth at the time of irradiation. (ii) The destruction and absorption of the malignant cells depend upon an adequate lymph and blood supply. The prior application of irradiation to the neck obviously would seriously jeopardize these. Questions of lymph and blood supply are possibly related to the radio-sensitivity of neoplasms, quite apart from the degree of differentiation of the cells. It can now be seen that the old question of whether the neck glands should be treated before or after the mouth lesion has been settled once and for all. In advanced and inoperable cancer of the tongue, when pain is a pronounced feature, it may be necessary to cut the lingual nerve or perform an alcohol block of the mandibular division of the fifth nerve. Another suggestion is that a patient with a hopeless cancer of the tongue, tonsil or floor of the mouth should be allowed to become an opium smoker.

Cancer of the Mucous Membrane of the Cheek.

Cancer of the mucous membrane of the cheek usually begins at a point of chronic irritation, as by a pipe stem habitually placed against it. A common site is along the line of junction of the upper and lower teeth, where a leukoplakic patch is first noticeable. Such a lesion is usually detected early by the patient and advice promptly sought. Excision of the patch is the best treatment, but if the condition is well advanced, radium needles or, better still, radon seeds, should be implanted around the periphery of the ulcer for seven days. The jaws opposite the growth will require to be protected from the rays by means of lead sheet moulded into position. We think, however, that if 0·8 millimetre of platinum be used in the needles, the use of shields will not be called for.

Cancer of the Floor of the Mouth.

Cancer of the floor of the mouth with us is a fairly common form of malignant disease. It usually begins in the frænum of the tongue or upon the sublingual fold as a raised, bluish-white, thickened area of small extent, but of irregular surface. Metastasis to the neck glands occurs early, and the condition is therefore a serious one. It is best treated by fencing it in with radon seeds of sufficient dosage *plus* the subsequent thorough removal of the cervical lymph glands, whether they are palpable or not. Birkett ("Radium Therapy: Principles and Practice"), in discussing the ætiology of cancer of the floor of the mouth, states that he has no explanation to offer for its occurrence. But it has always appeared to me that the toxins and organisms derived from septic conditions of the gums and tonsils (for cancer in the mouth practically never arises in a clean mouth), lying longest in the saliva always present in the floor of the mouth, must of necessity lie longest in contact with the tissues there and in this way intensify the changes already initiated by trauma in a pre-malignant area. It is

probably for a similar reason that aniline dye workers, when they do develop urinary tract cancer, get it in the bladder and not in the kidney or ureter.

Cancer of the Palate.

Cancer of the palate, when primary, is usually seen on the hard palate. For anatomical reasons both excision and the implantation of needles are unsatisfactory. Recourse should be had to either the "fencing in" of the lesion with radon seeds or the use of a vulcanite plate which carries needles within it and which, except at meal times, can be worn for the requisite number of milligramme-hours. Cancer of the soft palate is usually a secondary condition of extension from a primary growth in the tonsil or faucial pillar, and requires no special mention.

Cancer of the Tonsil.

Cancer of the tonsil is not by any means uncommon, and during the past four years alone we have seen at least fourteen cases at the clinic and in private practice. There are three varieties, epithelioma, lymphosarcoma and carcinoma. Most usually it appears as an epitheliomatous ulcer on the surface of the organ, which is soon covered with a dirty greyish slough. There rapidly ensue pain and interference in swallowing. Difficulty in opening the mouth renders it almost impossible to diagnose accurately and adequately cleanse and treat the growth. In its earlier stages it may quite readily be mistaken for a gummatous ulcer of the tonsil, especially if, as frequently happens, the blood gives a positive response to the Wassermann test. The lymphosarcoma begins as a pale swelling of the tonsil, which soon becomes painful and may so resemble a peritonsillar abscess that it is opened up on that assumption. Cancer of the tonsil is best treated, after the mouth has been thoroughly cleaned up, by burying radon seeds in and around the growth. To do this it may be necessary to cut the cheek horizontally back to or even through the masseter muscle. As many neoplasms of the tonsil are composed of undifferentiated cells, they are usually radio-sensitive and respond quickly to irradiation. If and when a clinical cure appears to have been obtained, the neck glands should be cleared out and, later still, the neck should be treated by the wearing of a radium collar or by deep X ray therapy. Owing, unfortunately, to the fact that the tonsillar gland lying in the angle between the common facial vein and the internal jugular vein is first and early involved in cancer of the tonsil, and that the gland in turn discharges directly into the lower deep carotid group, metastasis to the root and the neck and into the thorax occurs early and renders the prognosis almost hopeless. Moreover, cancer of the tonsil appears to be almost confined to elderly people of the working class, who will not or do not come for advice in the early stages of the complaint. This circumstance in turn adds greatly to the gravity of the prognosis.

CANCER OF THE BUCCAL CAVITY.[1]

By BASIL KILVINGTON, M.D., M.S. (Melbourne),
Honorary Surgeon, Melbourne Hospital, Melbourne.

CANCER inside the mouth is, apart from tumours arising in the bone of the jaw, practically always epitheliomatous. Sarcoma of the tonsil can hardly be grouped with buccal cancers, and though lip epitheliomata invade the inside of the mouth if advanced, this does not alter their primary extra-buccal nature.

True buccal cancer either starts on the inside of the cheek or on the palate or alveolar surface of the jaw. Cancers of the tongue, when advanced, also grow on to the floor of the mouth and to the tonsillar region and pillars of the fauces, but though this makes the treatment and prognosis much more serious, the essentials are unaltered.

Cancer starting from the inside of the cheek is uncommon. It is usually preceded by leukoplakia with fissures and a history of smoking to excess. The patient often gives a positive response to the Wassermann test. The exciting cause, as in epithelioma of the tongue, is often a jagged tooth or a dental plate with a rough edge pressing on the cheek. There are several types; the two main varieties are those with a papillary form and those with the typical hard indurated ulcer.

My opinion of these is that they should not be surgically removed, but treated with radium needles. It is comparatively easy under intratracheal anæsthesia to insert the needles and to suture them into cheek tissue to prevent movement. Prior to this all decayed teeth should be removed and all teeth scaled. The reaction is considerable, but the local result excellent and just as good as in lip and tongue cancer. The glands in the neck offer the same problems as in lip epitheliomata. It is probably best to remove the suitable glands surgically, whether they can be felt or not, and after to apply a radium collar as a prophylactic measure. It is annoying to find that in a supposed early case in which this has not been done, gland enlargement develops later on. If the glands are definitely affected, there can be no dispute concerning the procedure, unless they be fixed, in which case radium application in large doses is the only remedy.

Epithelioma of the hard palate is a fairly diffuse growth and in my experience almost always associated with an upper dental plate. The mucous membrane becomes chronically irritated by particles of food getting under the plate. I am strongly of opinion that dental plates should never be worn at night for this reason and should be removed and washed after each meal. This prophylaxis will go far to prevent cancer in this region.

These cases fortunately are usually seen before the bone tissue underneath is involved. Radium

[1] Read at the Third Cancer Conference, Canberra, March, 1932.

needles are useless, as the tissue cannot be used to anchor them, and it is necessary to implant them on a wax denture. Owing to the liability of the tongue to suffer from the effects of the radium, a layer of lead six millimetres (a quarter of an inch) or at least three millimetres (one-eighth of an inch) thick is attached under the wax. I always allow patients to remove this when eating, but prefer them to wear it at night as well as during the day, if they can stand it. This shortens the time of the radium exposure to not more than ten days, and I also hold that the remission of treatment for eight or ten hours in the night to a certain degree stimulates the growth. I recently had a patient who would wear the plate only two or three hours a day, and the growth was undoubtedly stimulated, and I should refuse to allow radium to be used in this way in future.

Epithelioma of the alveolus may arise in connexion with an ill-fitting plate or develop in connexion with a recently extracted tooth (probably it was in existence while the tooth was there). Unfortunately these growths are almost from the first in the bone tissue, as can be demonstrated by an X ray plate. Radium usually markedly improves the portion of the growth on the mucous membrane, but I have never seen it cure the bone extension. The same applies to lip or tongue cancer spreading on to the jaw.

I have come round to the opinion that surgery, with its mutilating effects and moderate mortality, has to be invoked to deal with this class of case. In a comparatively early case removal of the mucous membrane and a square of alveolus underneath may get beyond the growth, but I should not hesitate to sacrifice the whole thickness of the jaw if necessary. This problem is one that might well be discussed by the Conference. Occasionally the growth may be eradicated by applying radium needles on the inside of a wax mould, which lies over the alveolus. This usually requires a clasp below the chin to keep it in position. A slight bone involvement underneath can be dealt with by radical diathermy, which results in some necrosis later. Usually, however, the bone invasion is only partly destroyed and goes ahead, but at any rate the patient's life is lengthened by this treatment, though he is rarely cured.

Speaking as a surgeon, I should say that buccal cancer which has involved any bone requires surgical removal if it is not altogether beyond the scope of surgery.

SPINAL ANÆSTHESIA.

By R. FRANCIS MATTERS, M.D., F.R.C.S. (Edinburgh), F.R.A.C.S.,

Lecturer in Human Physiology and Pharmacology, Adelaide University; Honorary Assistant Gynæcologist, Adelaide Hospital.

THE recent dissertation of Dr. A. E. Brown[1] on the subject of spinal anæsthesia has brought forward in a very comprehensive manner the uses of this method of anæsthesia, and also its main difficulties and dangers.

As I have been interested in spinal anæsthesia, it seemed that further discussion of the question might not be without advantage. To the man who has to make shift because of the difficulties of obtaining an anæsthetist in emergencies, this type of anæsthesia is a very useful adjunct. Further, in very hot climates it is not always easy to induce anæsthesia with volatile anæsthetics.

Indications.

The cases which have offered most indications for spinal anæsthesia are those of patients who have pulmonary tuberculosis and who require surgical intervention in the pelvis, or prolonged operations. In these circumstances, during the first hour of the operation, a spinal anæsthetic may be used and so the use of volatile anæsthetics may be reduced to a minimum. An operation of this kind is Wertheim's radical operation for uterine carcinoma. In electrosurgery, as stated by Nadeau,[2] spinal anæsthesia is very useful. It obviates any trouble with volatile anæsthetics, which might result in explosions when the diathermy machine is operating.

Premedication.

Premedication in spinal anæsthesia has been the subject of considerable thought, and morphine and hyoscine are most commonly used. Certainly the hyoscine usually synergizes the morphine to a very great degree, but the hyoscine being a cortical irritant, may on occasions produce some degree of excitability. Brown uses "Luminal" by oral administration in one gramme (fifteen grain) doses; this is a fairly large dose, and it has the disadvantage that one is never sure how much is absorbed and how much more is to be absorbed. Especially is this so when volatile anæsthetics may be used. Here sudden absorption may coincide with the administration of the volatile anæsthetic and produce serious results.

We have used "Pernocton"[3] and feel that, because the amount absorbed is known, the depth of anæsthesia is unlikely to increase, and, further, the drug is rapidly eliminated.

Blood Pressure.

The fall in blood pressure resulting from spinal anæsthesia occurs presumably because the preganglionic fibres, from the sixth dorsal to the second lumbar segment, become paralysed by the anæsthetic. If, however, 0·03 gramme (half a grain) of ephedrine be given before the spinal injection, and if it be repeated when the intrathecal anæsthetic has been given, then the splanchnic arterioles are less liable to dilate, because the arteriolar constriction is maintained by means of the ephedrine even after the sympathetic constrictors have been paralysed. Subsequent fall of blood pressure may occur in the nature of surgical shock, and there is capillary pooling of the blood, due to the histamine effects upon the capillary walls.

We have had excellent results following the intravenous administration of hypertonic glucose solution. Cases have been reported elsewhere showing the rise of blood pressure during the remainder of the operation following the intravenous administration of fifty cubic centimetres of a 50% solution of glucose.

The cause of the vomiting in spinal anæsthesia is probably a disturbance of the parasympathetic when the balancing sympathetic effect is removed. With regard to post-operative backache and headache, it would seem that they result from mechanical stimulation. Of some sixty patients who had lumbar puncture for diagnostic purposes, we have found that the majority had headache or backache. The last twelve operations were done with a change of technique, after the manner advocated by Pitkin,[4][5] and there were only two cases of headache.

Technique.

The site for injection is found by palpation, and the area is made clean. The point for insertion of the needle is infiltrated with 2% "Novocain" solution. A tenotomy knife is then passed down to the meninges, a track thus being provided for the thin needle. The needle is a flat bevel 22 gauge type, and is directed along the knife track and pushed through the meninges into the theca; the sana-lock syringe is then fitted to it. The "Novocain" or "Spinocain" is administered slowly; with the former the patient is in a sitting position; with the latter the lateral position is used, owing to the lower specific gravity of the "Spinocain". We have found that "Spinocain" has an action which is rather variable, probably because the gliadin holds the "Novocain" *et cetera* together in a globule like that of a spirit level. It is thought that Zwar[6] would modify the attitude towards toxicity were he to employ the newer methods with the reduced irritation of the meninges resulting from the large needles.

"Stovaine" provokes a meningeal irritation by its more acid content or by actual "Stovaine" crystals being deposited on the meninges. There is also a leucocytosis due to sterile inflammation of the meninges.

Summary.

1. Spinal anæsthesia by the introduction of "Spinocain" into the theca is not very dangerous.
2. "Spinocain" is not entirely reliable for its results.
3. Premedication with "Pernocton" is quite satisfactory.
4. Ephedrine tends to maintain the vasoconstriction of the splanchnic vessels when the splanchnic nerve is paralysed.
5. Hypertonic glucose solution is a great help in the recovery of the patient's blood pressure.

References.

(1) A. E. Brown: "Spinal Anæsthesia", THE MEDICAL JOURNAL OF AUSTRALIA, May 14, 1932, page 674.
(2) O. E. Nadeau: "Electrosurgery", *Surgery, Gynecology and Obstetrics*, Volume LII, 1931, page 511.
(3) R. Francis Matters: "'Pernocton' in Obstetrics", THE MEDICAL JOURNAL OF AUSTRALIA, November 21, 1931, page 650.
(4) G. F. Pitkin: "Spinocain, the Controllable Spinal Anæsthetic", *The British Medical Journal*, August 3, 1929, page 183.
(5) F. A. Kelly: "The Clinical Aspects of Controllable Spinal Anæsthesia", *The British Medical Journal*, August 3, 1929, page 187.
(6) B. T. Zwar: THE MEDICAL JOURNAL OF AUSTRALIA, May 14, 1932, page 694.

DIABETIC COMA: PRINCIPLES OF TREATMENT BASED ON ANALYSES OF THE BLOOD AND URINE.

By W. WILSON INGRAM, M.C., M.D.,
Honorary Director, Institute of Medical Research; Honorary Physician, Royal North Shore Hospital; Honorary Physician, Lewisham General Hospital, Sydney,

AND

G. V. RUDD, M.Sc.,
Senior Biochemist, Institute of Medical Research, Royal North Shore Hospital of Sydney.

MODERN treatment of diabetic coma has resulted in the focusing of attention during the critical period of the illness on constituents of the blood other than the sugar. Thus Lawrence[1] presented details of blood analyses showing very low chloride and high urea values, which he attributed to dehydration of the patient. Lyall and Anderson[2] stressed the importance of blood urea estimations on patients suffering from diabetic coma, and found that the mortality is markedly increased when the blood urea exceeds 100 milligrammes *per centum* as a consequence of renal involvement. Dodds and Robertson[3] determined the degree of ketosis of comatose diabetics and concluded that death resulted, not from ketosis or acidosis, but from persistent fall in blood pressure from circulatory failure. Despite these conclusions, it must still be recognized that the outstanding signs of the precomatose diabetic are very pronounced hyperglycæmia and ketonuria. In the absence of ketonuria an untreated hyperglycæmic patient will not be in a condition approaching coma. Therefore, ketosis will not be discarded by clinicians as a useless guide in the treatment of the patient, although its direct relation to the causation of coma is questioned.

In this report seven histories of comatose or precomatose diabetics are considered from the point of view of the results obtained by analysis of their blood for sugar, ketones, chloride, urea and creatinine and of their urine for ketones. These results are presented in three tables.

In Table I it will be seen that there is no constant relation between the blood sugar, the ketosis and the condition of the patient. In Case A the blood sugar reading fell progressively, and at fifty-one hours after admission to hospital was 0·24%. At the same time the blood ketone values fell from 81 milligrammes *per centum* on admission of the patient to 25 milligrammes *per centum* after twenty-

four hours without any improvement in the patient's condition. Thereafter they rose to 48 milligrammes *per centum* at fifty-one hours when the patient had recovered consciousness. The urine ketones ran parallel to the blood ketones, being 233 milligrammes *per centum* on admission, 31 milligrammes at twenty-four hours, and 82 milligrammes at fifty-one hours. In Case B, although at the end of thirty-three hours there were only 26 milligrammes *per centum* of ketones in the blood, the patient's condition had not improved. Recovery to consciousness followed during the next day, when the blood sugar had increased slightly and the ketones had only slightly diminished further. In Case C, although the blood sugar fell to 0·20% in eighteen hours and the blood and urine ketones practically disappeared, the patient died.

TABLE I.

Case, Sex and Age.	Hours.	Blood Sugar Percentage.	Blood Ketones. Milligrammes *per centum.*	Urine Ketones. Milligrammes *per centum.*	Condition of Patient.
A. Female. 24.	0	0·60	81	233	Semi-comatose.
	24	0·40	25	31	Semi-comatose.
	51	0·24	48	82	Recovered consciousness.
B. Male. 19.	0	0·51	—	—	Semi-comatose.
	11	0·27	64	211	Semi-comatose.
	33	0·31	26	55	Semi-comatose.
	57	0·35	12	30	Recovered consciousness.
C. Female. 38.	0	0·62	94	284	Comatose.
	18	0·20	5·4	10	Comatose.
	48	—	—	—	Died.

These observations confirm those of Dodds and Robertson,[3] that a quantitative estimation of the ketones of the blood and urine give no guide to the ultimate prognosis. We would add that the blood sugar, always high in diabetic coma, may be substantially reduced without any improvement in the condition of the patient.

Lawrence[1] has published figures from cases of diabetic coma showing very low blood chloride, which he interprets as proof of dehydration. We have been unable to confirm this finding of Lawrence, as a perusal of Table II will show. In Cases A, B and D, in which the patients recovered, the tendency was for the blood chloride to decrease from above the upper normal limits to the lower normal limits as the patient's condition improved. In Case C the blood chloride was distinctly raised, and rose still further before the patient's death.

In Table III are given figures showing the degree of nitrogen retention in seven cases of comatose or precomatose diabetes. Difficulty was experienced at first in getting accurate creatinine figures, but Rudd[4] has shown that it is impossible to apply to some specimens of diabetic blood the Myers[5] method for the estimation of creatinine. This is due to two interfering factors, one of which is the high glucose content of the blood. The Folin-Wu[6] method of tungstic acid deproteinization of blood and of subsequent estimation of creatinine is accurately applicable to all specimens of diabetic

TABLE II.

Case, Sex and Age.	Hours.	Blood Sugar Percentage.	Blood Chloride as Grammes of Sodium Chloride *per centum.*	Condition of Patient.
A. Female. 24	0	0·60	0·480	Semi-comatose.
	24	0·40	0·508	Semi-comatose.
	51	0·24	0·442	Recovered consciousness.
B. Male. 19.	0	0·51	—	Semi-comatose.
	11	0·27	0·472	Semi-comatose.
	33	0·31	0·486	Semi-comatose.
	57	0·35	0·444	Recovered consciousness.
C. Female. 38.	0	0·62	0·518	Comatose.
	18	0·20	0·533	Comatose.
	48	—	—	Died.
D. Male. 16.	0	0·46	0·517	Semi-comatose.
	43	0·30	0·490	Recovered consciousness.

TABLE III.

Case, Sex and Age.	Hours.	Blood Sugar. Percentage.	Blood Urea. Milligrammes *per centum.*	Blood Creatinine. Milligrammes *per centum.*	Condition of Patient.	Insulin Administered.
						Units.
G. Male. 49.	0	0·90	—	—	Comatose.	
	2	1·00	74	5·1	Comatose.	100
	9	—	—	—	Died.	550
C. Female. 38.	0	0·62	56	3·0	Comatose.	
	2	0·70	—	—	Comatose.	100
	18	0·20	95	3·7	Comatose.	510
	48	—	—	—	Died.	
D. Male. 16.	0	0·46	49	4·8	Semi-comatose.	
	2	0·53	—	—	Semi-comatose.	100
	43	0·30	61	2·7	Recovered consciousness.	400
	12 days.	0·08	27	3·1	Very well.	
F. Female. 46.	0	0·70	—	—		
	2	0·77	67	4·6	Semi-comatose.	100
	19	0·09	—	—		410
	26	0·54	63	3·7	Recovered consciousness.	
	70	0·20	40	1·9		
B. Male. 19.	0	0·51	—	—	Semi-comatose.	
	11	0·27	60	4·5	Semi-comatose.	160
	33	0·31	44	2·7	Semi-comatose.	
	57	0·35	44	2·8	Recovered consciousness.	
E. Female. 24.	0	0·45	39	4·3	Semi-comatose.	
	19	0·16	47	1·9	Recovered consciousness.	
	65	0·49	86	2·5	Recovered consciousness.	250
	89	0·18	53	2·1		
A. Female. 24	0	0·60	82	3·9	Semi-comatose.	
	2	0·65	—	—	Semi-comatose.	100
	24	0·40	64	2·3	Semi-comatose.	400
	51	0·24	48	2·9	Recovered consciousness.	

blood, and is the method by which the creatinine values of Table III were determined. Of these patients, G died nine hours after admission. He had received 550 units of insulin in that time, and his blood sugar had not been below 0·86%. Patient C died forty-eight hours after admission to hospital, although the blood sugar had been reduced to 0·20% within the first eighteen hours and had thereafter remained in that vicinity. Both of these patients showed retention of urea and creatinine. The remainder of the group, however, had similar nitrogen retention during the severe stage of their illness, but with progressive recovery the blood urea and, more rapidly, the blood creatinine ultimately decreased towards normal levels. There is no direct relationship between the glucose and the urea and creatinine contents of the blood, but, perhaps indirectly, as will be discussed below, intensive insulin therapy is followed frequently by an increase in the blood urea. In attempting to correlate these findings with the course of the illness, three possible causes of nitrogen retention must be considered: (i) dehydration of the patient, (ii) excessive protein metabolism, (iii) renal involvement.

Clinically it is an accepted fact that dehydration of the plasma and tissues occurs in a severely ill diabetic. Vomiting, so very frequently met with, and polyuria continuing when the patient is no longer able to attempt to satisfy his thirst, are the factors contributing to the dehydration. Increases in the blood cell counts, in hæmoglobin, in plasma protein and in chloride have been found by Bulger and Peters[7] and attributed to the dehydrated condition of the patient. To these it must be added that, partly at least, the raised blood urea and creatinine are attributable to the same cause. Intensive administration of fluids is followed, as the patient responds, by decreases in the blood chloride, the blood creatinine, and, more slowly, the blood urea. Dehydration, however, cannot be held solely responsible for such increases in the blood urea as are demonstrated by the cases recorded in Table III, where the value reaches twice normal or more. Other factors in addition to dehydration must be considered in attempting an elucidation of these figures.

The blood sugar two hours after the first dose of 100 units of insulin (except in Cases B and E, for which figures are not available at this time) showed, not the expected fall, but a rise. It has been suggested that this rise in the blood sugar after the administration of insulin is due to a latent period that occurs before insulin begins to produce its effect. There is, however, no experimental evidence to support this. The presence of an infection inhibits the action of insulin, but in this series of cases only Patient D was suffering from an infection. For this and the remaining cases, therefore, the source of the increase in the blood sugar must be largely attributed to the incomplete katabolism of protein of endogenous origin. Chaikoff[8] states the current hypothesis that the glucose is derived from protein in diabetic animals whose stores of liver glycogen are practically exhausted. The attempt of the diabetic organism to meet its nutritive requirements by excessive katabolism of protein is followed by the accumulation of urea in the blood. Thus, in the cases in Table III, the blood urea, after the first period of intensive insulin treatment of the patient, was sometimes higher than at the beginning of treatment, whilst the blood sugar had responded by falling fairly well. At this stage, then, the insulin is effecting the metabolism of the glucose derived from protein and the nitrogen of the protein is accumulating in the blood.

The third factor causing nitrogen retention is the presence of renal damage. The kidneys are involved in the majority of cases of diabetic coma. This is shown by the presence in the urine of albumin, casts and red blood cells and, in addition, by oliguria or, in some cases, anuria. In both Cases G and C, which terminated fatally, renal damage was found at *post mortem* examination. There was a chronic interstitial nephritis with a superimposed acute tubular inflammation, resulting from vascular disturbance in the kidney and from the toxic effect of the continued excretion of sugar and ketones.

The renal damage in the majority of cases is, however, transitory. The blood urea and creatinine values in Table III, if found in cases of non-diabetic nephritis, would indicate a bad prognosis. Even when, in the treatment of nephritis, it is possible to reduce the blood urea, the blood creatinine is unaffected and the slow improvement may be only temporary. In diabetics, however, in whom these results were found, a rapid decrease to normal figures occurred in the creatinine readings as the patient recovered and the urea decreased more slowly. Berglund[9] and Rehberg[10] have shown that the blood creatinine of a normal individual may be raised to high levels by the ingestion of five grammes of creatinine and fall again to normal limits within a few hours. This result is similar to those of the diabetic recovering from coma, for then the patient rapidly recovers the ability to excrete creatinine in sufficient amount to reduce the blood creatinine to normal. The accumulated urea, which is less readily concentrated from the blood to the urine than creatinine, is removed from the blood at a slower rate than the latter.

Therefore, whilst it must be admitted that the raised blood urea and creatinine values found in comatose or precomatose diabetics are due, in part at least, to renal insufficiency, it is incorrect, on account of the transient nature of the partial renal failure, to attribute to them the prognostic significance which attaches to them in non-diabetic nephritis.

Some Principles of Treatment.

It is now evident that although hyperglycæmia and ketonuria are constantly present in diabetic coma, an estimation of the blood sugar or the urine ketones gives no certain indication of the prognosis.

On the other hand, much can be learned from a study of the blood non-protein nitrogen. Nitrogen retention is a constant feature and the blood creatinine and urea vary with the progress of the patients, since it depends upon dehydration, disordered protein metabolism and renal damage.

The dehydration increases the percentage of toxic substances in the blood and by rendering the blood more viscid puts a greater strain on the heart. Therefore, an important principle in the management of diabetic coma is to replace the fluid lost to the body by the intravenous administration of normal saline solution in quantities as large as practicable. It is not necessary nor desirable to add bicarbonate or glucose to the solution. It may be suggested that, since the renal damage is partly caused by the passage of toxic acids, it would be good treatment to add sodium bicarbonate to neutralize the acids and to replenish the blood bases. The administration of fluids and insulin, however, is sufficient to effect the desired diminution of the degree of acidosis.

The next principle of treatment is to begin immediately the correction of the disordered metabolism which is manifested by the presence of the products of the incomplete metabolism of carbohydrate, protein and fat. The duration of this process before the onset of coma has been sufficiently long to cause great elevation of the blood sugar. This may be corrected by the judicious administration of insulin. It may be argued that, since the accumulation of urea in the blood is partly due to the incomplete metabolism of endogenous protein, it would be wise to administer glucose with the insulin in order to check protein metabolism. The giving of more glucose, however, will only add to the already elevated blood sugar. Although the liver is greatly depleted of glycogen, there will be sufficient glucose in the blood and tissues to prevent the occurrence of hypoglycæmia from the large doses of insulin administered. Thus insulin will correct the disordered metabolism, but the process takes time, and the improvement, as already demonstrated, is not directly related to the height of the blood sugar. The amount of insulin administered must be controlled by blood sugar estimations, or if these are not available, by urinary sugar tests, for the danger of allowing the patient to lapse into hypoglycæmic coma must be guarded against.

The elimination by the kidneys of the toxic products of disordered metabolism will cause renal damage. If this is checked in time, the kidneys will recover rapidly, but, if not, a terminal nephritis results. Therefore, another principle of treatment is to eliminate the toxic substances in the blood and at the same time to rest the damaged kidneys to give them a chance to recover. This will best be done by correcting the defects of metabolism and by an attempt to eliminate toxic substances by the bowel. Therefore, enemata will be administered and as soon as the patient can swallow, aperients will be given. In addition, shock will be counteracted with warmth, which will at the same time stimulate skin action.

Fortunately diabetic coma is becoming increasingly rare. There is no doubt that the newer principles of treatment, based on higher carbohydrate and lower fat diets, will make it an even rarer occurrence, as there will be less tendency to ketosis, with its consequent kidney irritation.

Acknowledgement.

This work was carried out under the T. E. Rofe Bequest.

References.

(1) R. D. Lawrence: "The Treatment of Desperate Cases of Diabetic Coma", *The British Medical Journal*, April 12, 1930, page 690.
(2) A. Lyall and A. G. Anderson: "Diabetic Coma: The Significance of Alteration in the Blood Urea", *The Quarterly Journal of Medicine*, April, 1932, Volume I, page 353.
(3) E. C. Dodds and J. D. Robertson: "The Relation of Acetoacetic Acid to Diabetic Coma, and the Cause of Death", *The Lancet*, April 19, 1930, page 852.
(4) G. V. Rudd: "Note on the Estimation of Creatinine in Diabetic Blood", *The Australian Journal of Experimental Biology and Medical Science*, December, 1931, Volume VIII, page 203.
(5) V. C. Myers: "Practical Chemical Analysis of Blood", Second Edition, pages 69-76.
(6) O. Folin and H. Wu: "A System of Blood Analysis", *The Journal of Biological Chemistry*, Volume XXXVIII, 1919, page 81.
(7) H. A. Bulger and J. P. Peters: "The Concentration of the Blood and of the Urine in Diabetic Toxemia", *Archives of Internal Medicine*, Volume XXXVI, December, 1925, page 857.
(8) I. L. Chaikoff: "Observations on the Ketone Body Excretion, the Dextrose to Nitrogen Ratios, and the Glycogen Content of Liver and Muscles of Fasted Depancreatized Dogs", *The Journal of Biological Chemistry*, Volume LXXIV, July, 1927, page 203.
(9) H. Berglund: "Nitrogen Retention in Chronic Interstitial Nephritis and Its Significance", *The Journal of the American Medical Association*, October 21, 1922, page 1375.
(10) P. B. Rehberg: "Studies on Kidney Function. I. The Rate of Filtration and Reabsorption in the Human Kidney", *The Biochemical Journal*, 1926, Volume XX, page 447.

Reports of Cases.

BUCCAL CARCINOMA.[1]

By I. B. Jose, M.S. (Adelaide), F.R.C.S. (England),
Honorary Surgeon, Adelaide Hospital, Adelaide.

This small series of cases of buccal carcinoma treated at the Adelaide Hospital Radium Clinic from August, 1929, to December, 1931, comprises forty-seven patients for whom curative and palliative treatment was attempted. The results cannot be said to be satisfactory as even after this short interval only eight are alive and at present free of evidence of their disease, and three more are still undergoing palliative treatment for extensive lesions.

The sites of the growths, the nature of which were all proved by microscopical section to be carcinoma, were:

Tongue, anterior two-thirds	6
Base of faucial pillar	5
Vallecular fossa	2
Floor of mouth	18
Recurrence in stump after surgery, and in floor after diathermy	5
Palate	3
Pharynx	2
Tonsil	6

Of these forty-seven cases, thirty-three were definitely inoperable owing to extent of invasion of the growth locally, fixed glandular metastases or general metastases. These include five cases of recurrence after surgical

[1] Read at the Third Cancer Conference, Canberra, March, 1932.

procedures. All of the patients, except the three who were moribund, above mentioned, are dead. About one-half of them had partial or complete local healing of the growth during the remaining few months of their life to justify the attempt of palliative treatment, and died of metastases. The remainder either died before treatment could affect the growth or did not obtain relief of symptoms.

Eight further cases could be grouped as "borderline", five patients are alive and well. In two of these the growth was situated in the tongue at the faucial pillar. (One healed locally, but the patient died of metastases six months later. The other is still well after one year.)

Three growths occurred in the floor of the mouth; two patients are well after eighteen months and one year respectively. One, a woman whose gland area was treated by a radium mould only, died.

Two growths occurred in the palate; one patient died of bronchitis two and a half years after treatment with no sign of his lesion. One is well, but it is only four months since treatment.

One growth occurred in the tonsil and was treated by electrocoagulation and the application of a mould to the neck. The patient is alive and well, and free from sign of disease after eighteen months.

The remaining six cases alone could be classed as reasonable "operative risks". Four occurred in the anterior two-thirds of the body of the tongue. Two patients are alive and free of signs of disease one year and nine months after treatment respectively. Two died during treatment from reasons apart from their disease. Of these one had the glands of the neck dissected out ten days after the insertion of radium in the tongue and his wound became grossly infected and was the cause of death. The other did not recover from the dissection of the neck done under "Avertin" anæsthesia.

Two cases occurred in the floor of the mouth. One patient died eighteen months later of auricular fibrillation, there being no carcinomatous lesion found *post mortem*. The other is alive and free of signs of disease fifteen months later.

Plan of Treatment Used.

For the primary lesion, unit strength needles, screened with 0·5 millimetre of platinum, buried in and round the margins of the evident growth, were used. In some of the more extensive growths there was difficulty in insuring adequate radiation of the posterior part of the growth. No attempt was made to protect bone. Two cases of slight bone necrosis occurred, one of palate, one of mandible, following irradiation of a tonsil.

In one of the tonsil cases and one of the vallecular fossa of the tongue electrocoagulation of the primary lesion was done. In both these cases recurrences occurred locally, and in the former this was successfully treated with radium needles.

In all the operable cases of cancer of the tongue or floor of the mouth a complete dissection of one side of the neck from clavicle to jaw, including the jugular vein, was carried out when the radium reaction in the mouth had nearly subsided. This was done in six cases, and a less complete excision was done in three, followed by application of a radium mould to the neck at two to three centimetres distance as soon as the wound was healed. In a majority of nine cases so treated the glands were found microscopically infected with carcinoma. In those cases deemed unsuitable for excision of glands owing to debility or advancement of growth, a radium mould alone was applied. In only one of these cases with palpable glands did the glands do more than recede temporarily.

Of four patients with no palpable glands treated by a radium mould only, two later developed glandular enlargements. The remaining two died of intercurrent disease, not cancer.

The surgical procedures have been performed by various members of the Adelaide Hospital surgical staff.

Conclusions.

The cases treated have all been advanced, some very advanced. One cannot draw conclusions from so small a series, but our impressions have been as follows.

Radium has locally controlled all those growths which have been contained in reasonable limits and did not grossly invade surrounding cellular tissue, have not involved bone, and could be efficiently irradiated (from the mechanical point of view).

The glandular deposits are most safely dealt with by a complete dissection of the whole anterior triangle of the neck whenever possible. The time for this is after radiation of the primary growth, and at an interval to allow the reaction in the mouth to have almost settled and so obviate infection. In one case in which incomplete excision was done, recurrence occurred in the remaining glands. Exception to a complete excision may be made in certain of the less malignant types of carcinoma of the palate and cheek. In mid-line cases in the floor of the mouth both sides of the neck should be dissected with an interval between. We have followed our cases of surgical excision by irradiation with a radium mould as an extra precaution.

PUERPERAL INSANITY.

By S. J. CANTOR, M.B., B.S. (Melbourne),
Senior Medical Officer, Lunacy Department, Victoria.

MENTAL symptoms may occur as a complication during pregnancy, during the puerperium, or during the lactational period. Those cases which occur during the puerperium often give rise to much anxiety, and the consequences are frequently melancholia with suicidal tendencies. Recovery is, however, to be expected at an early date. The following case histories will serve to emphasize the important points in regard to insanity in the puerperium.

Case I.

Mrs. W., aged twenty-five years, was admitted to hospital on October 15, 1928. She was anæmic. Her temperature was 37·2° C. (99° F.). The pulse was of low tension and the rate was increased. The lochia was scanty. She had had no previous illness and had no insane relatives.

She was hearing voices speaking to her "through her backbone". She was restless. She tried to get out of bed to see snakes under the bed. She had been confined at her first childbirth a month previously, instruments having been used. She had become mentally affected a fortnight later, and at that time her temperature was as high as 40·5° C. (105° F.).

On October 17 she was slightly confused and apprehensive. She complained of nausea. On the following day she was depressed and lachrymose. She believed that her baby was dead. Sleep was poor. She was frightened of her relatives. She heard the voice of a friend talking to her at night. She was slightly confused. She suffered from changing moods. She gradually improved and was discharged on November 1, 1928.

Comment.

The common form of mental disorder, when it occurs during the puerperium, is a confusional state. Hallucinations are frequent. Depression and apprehensiveness are usual. Puerperal cases clear up quickly as a rule; cases occurring in the lactational period generally take longer.

Case II.

Miss S., aged twenty years, was admitted to hospital on July 13, 1928. She was pale; her heart, her lungs and her abdomen were apparently normal. There was no reaction to the Wassermann test. The temperature was 37·7° C. (100° F.), and her tongue was dry. She had given birth to a child fifteen days before admission. The uterus and vagina had been packed six hours after delivery because of hæmorrhage. Severe hæmorrhage had occurred four days before admission. Hot vaginal douches had been given, in addition to quinine sulphate. The condition was one of sapræmia.

She was shouting and using obscene language. She said she "died last night and came to life again". She said

all her relatives were murdered. On July 14 there was no lochia and she had no pain. She coughed up fœtid mucus. She was given an injection of streptococcal antiserum (ten cubic centimetres) intramuscularly. On July 15 she said she was dead, and lifted up her arms to prove it. She was confused and impulsive and irritable. During the following days she improved; the temperature was normal. She was easily fatigued. She failed to recognize her sister. She became less pale.

On July 28 she had a temperature of 39·4° C. (103° F.); signs of right lobar pneumonia were present. Mentally she was unimproved; she said that everybody else was a devil and that she was dead. Streptococcal antiserum was again given. The pneumonic process was slow in subsiding. On August 29 she was slowly improving. In November she was stronger. She was afraid that somebody would cut her head off. She was seeing devils. She continued to improve and was able to leave the hospital in January, 1929.

Comment.

Patients suffering from puerperal insanity frequently have suicidal tendencies; but frequently no direct indication of this tendency is given. The patient may state that she has died or may be afraid that others may be going to kill her; such ideas may be interpreted as meaning that the patient may do harm to herself. A puerperal patient suffering from mental disorder should never nurse her baby; there is always the danger of her killing it.

Case III.

Mrs. W., aged twenty-two years, was admitted to hospital on August 29, 1929. She was feverish; her temperature was 37·7° to 38·9° C. (100° to 102° F.). Her pulse rate was 120 to 140 per minute. The lochia was scanty. The tongue and lips were dry, the face was flushed. Nothing abnormal was detected in the chest. She was mentally excitable, violent at times, and imagined she was someone else. She refused nourishment. She talked continually and was delirious at times. She had little sleep. She was euphoric and emotional and was continually going imaginary journeys.

From September 2 her temperature was normal and she was physically well. During the rest of the month she was somewhat excited, wanting to go to her father's grave, adding that he was not dead. She said she was twenty-one years old and had been married for forty years, and that "they" said she had killed the babies. She had hypomania, her habits were faulty, she was slightly elated, and was easily fatigued. During October she was slightly confused, not amenable to reason, erratic; she was unable to recognize herself. She stated that she had had 30,000 babies. She was sleepless and interfering, self-willed and rather irritable. She was rather solitary and negativistic.

In November she was more or less unmanageable. She was excitable, over-active, changeable and obstinate. She continued to improve and was allowed out on probation in December.

Comment.

Toxic cases may show a condition of elation with excitement; this may alternate with depression. Although puerperal insanity usually clears up rapidly, recovery may be delayed.

Case IV.

Mrs. S., aged thirty-three years, a *multipara*, was admitted to hospital on March 2, 1930. She had been ailing for three weeks. Her child was five weeks of age. Her health had been fairly good. She was pale; there was no reaction to the Wassermann test. She was mentally depressed and excitable. She said the doctor intended to do away with her. She threatened to poison her children and threatened suicide. She slept poorly. During the month her condition was variable; at times she was brighter, at others depressed and lachrymose. She said her legs felt dead and she felt weak; she sighed frequently.

In May she was generally depressed and felt she would never be better. She was self-accusing and wanted to die, and was surprised each morning to find she was not dead. She also wanted her children to die and said they wanted to die. She added that they would have to be killed. She feared she had injured the children.

In June she was physically stronger, mentally rather less depressed. At times she said she was tortured and wanted to be put out of her misery. She wore a melancholy expression.

In July she was less emotional. She was inclined to be solitary.

She was allowed out on probation in August and discharged five months later.

Comment.

Persons suffering from puerperal insanity frequently show the symptoms of an acute melancholia. Such patients may be solitary, keeping to themselves; they may be self-accusing and self-depreciatory. Sleep may be poor. There may be danger of suicide not only in the acute stage, but also during convalescence.

Reviews.

A TEXT BOOK ON SURGERY.

THE tenth edition of Da Costa's "Modern Surgery" has been published.[1] This book has been used for many years and much that it contains must be regarded as authoritative. At the same time it suffers from a fault common to many books of this type. New editions are brought out and the old is not carefully revised. No attempt will be made to review this enormous book of 1,356 pages, but it may be of service to draw attention to a few subjects in which the author has failed, and sometimes failed badly, to keep abreast of the times. The subjects chosen have been taken at random, and doubtless could be multiplied without much trouble. The author refers to carcinoma of the lower lip sometimes arising in smokers, and states that a short-stemmed clay pipe which grows hot when it is smoked is particularly apt to "lead to the cause of irritation". This statement must have been copied from one text book to another, and is a gross overstatement of fact. The number of patients with cancer of the lower lip who have smoked a clay pipe must be very small, while the number who have been exposed to sunburn of the lower lip (the author does not mention this) must be very large. In discussing treatment of cancer of the lower lip, long descriptions are given of surgical operation for its removal. The only reference to irradiation under this heading is that "after an operation the x-rays [*sic*] should be used to antagonise recurrence"; and this in a book bearing the date 1931!

In discussing the treatment of carcinoma of the mammary gland, the author begins by stating that the treatment is early and thorough operation; "the earlier and more thorough, the better". He has several pages in which he describes and illustrates various surgical operations. He certainly refers to the conclusions of the committee of the American College of Surgeons in regard to this matter, and under these itemized headings some reference is made to the use of X rays, but the author obviously regards X rays as being merely a possible adjuvant to surgical operation. His reference to radium is made in his discussion of inoperable malignant disease of the breast. Here he writes: "It is said that in some cases radium is more efficient than the x-rays, but it is probable that most improvements by radium could have been obtained by the x-rays."

[1] "Modern Surgery, General and Operative", by J. C. Da Costa, M.D., LL.D., F.A.C.S., assisted by B. Lipshutz, M.D., F.A.C.S.; Tenth Edition, 1931. Philadelphia: W. B. Saunders Company. Melbourne: James Little. Royal 8vo., pp. 1404, with 1050 illustrations, some in colours. Price: 60s. net.

In the section of anæsthesia no mention is made of "Avertin", though quite a useful discussion on the use of chloroform and ether will be found.

Sympathetic ramisection is dismissed in eleven lines. In these eleven lines the language, as elsewhere, is slovenly. "Ramisection claimed to reduce spasticity." One wonders how a surgical procedure could claim anything. Its originator claimed something and he will no doubt be interested to read the following abstruse sentence: "The section and removal of the sympathetic does not affect muscle bone sufficiently, if at all to be of any practical value." The author believes that similar and better results are obtained by older established orthopædic measures. In discussing Hirschsprung's disease, the author makes brief reference to the use of "ramisectomy" and gives credit to Wade and Royle. Why he should call the operation ramisection in one place and ramisectomy in another is not clear.

The section on prostatectomy should be entirely rewritten. The author states that in prostatectomy hæmostasis is extremely important. He adds that numerous methods have been advocated: "massage of the prostatic capsule, irrigation with hot fluids, tampons in prostatic bed, and suturing." His only remark in regard to sutures is that they can be used in conjunction with the Hagner bag and Pilcher's modifications. The author must surely know something about the operation devised by S. H. Harris.

If Da Costa's book is to be used by students, it should be used under the guidance of a teacher who can draw attention to deficiencies such as we have mentioned. It is a pity that a book with a good reputation should be marred in this way. Man cannot live "by bread alone", a lover cannot live on love, no more can a book live on its reputation. Da Costa's "Modern Surgery" needs thorough revision, and we would advise the author, if he proposes to publish an eleventh edition, to employ a skilled editor.

ASTHMA AND HAY FEVER.

A. F. COCA, M. WALZER AND A. A. THOMMEN have produced a classical work on asthma and hay fever, containing over 700 pages.[1] A. F. Coca discusses hypersensitiveness, anaphylaxis, atopy and allergy; he covers the ground of the known facts on these subjects, discusses their causation and mechanism, and quotes a great number of authorities. His own opinions are freely stated, and in addition he deals shortly with serum disease, the Casoni and tuberculin tests, and the local skin reactions to bacterial filtrates described by Schwartzman. Finally, he summarizes the methods of preparation of extracts and solutions for use in testing and treatment in human hypersensitiveness. The value of these descriptions by a man of his knowledge and experience is immense, and one feels that here at last is an authoritative statement on these vexed questions.

M. Walzer, in dealing with asthma, discusses the early history, the theories and the pathology of the condition. He shows that there is as yet no agreement as to whether bronchial spasm or œdema is the underlying cause of the respiratory distress; he follows Coca, who favours œdema. Walzer also discloses the amazing fact that only thirty-three full *post mortem* reports have been published on cases of asthma, and he ascribes this to the curious truth which these and probably other unpublished reports of autopsies have revealed, namely that there are no characteristic pathological changes found. Asthma is certainly an hereditary disorder; it occurs more frequently in clay soil districts, and is less often observed at heights of 1,500 to 1,800 metres.

Occupation plays a small part in causation, except in the case of millers and bakers; but dusts, fumes, smoke, dyes and drugs may precipitate or aggravate an hereditary taint; contact with animal epithelia may have a similar effect.

Infections of the upper or lower respiratory tract are frequent precursors of asthma, but treatment or removal of the infecting agent, for example, infected sinuses or adenoids, does not necessarily relieve the asthma. Moulds, house dust and dust from the patient's surroundings are now regarded as important causes of the paroxysm. Cutaneous tests with bacterial substances are not of diagnostic value at present. In treatment the remedies suggested are adrenaline, ephedrine, iodides and lobelia, with morphine or chloroform in the last resort. Asthma powders and cigarettes with strammonium or atropine containing drugs are recognized as a mode of relief. Rest, catharsis and a minimum diet are necessary for severe paroxysms. More than one-half of asthmatic individuals are hypersensitive to atopens, and attempts should be made to eliminate or desensitize against these.

Children are most frequently sensitive to eggs, milk and wheat; fortunately, most of them outgrow their sensitiveness. Autohæmotherapy, five to ten cubic centimetres of blood given twice a week, has an immediate beneficial effect in some cases of asthma, as in urticaria and angioneurotic œdema; this method is used only in adults. Tuberculin, milk, peptone and vaccine injections are said to produce temporary benefit only.

Three hundred pages of this work are devoted to hay fever. A. A. Thommen writes at great length on all phases of this condition. He emphasizes the difficulty in evaluating skin tests and the danger of casual treatment. It is interesting to read the views expressed on the value of pollantin, which was the outcome of Dunbar's work. Thommen considers it useless, but he points out that it took years to arrive at this conclusion and that even now many are unconvinced. The specific treatment recommended here is that of inoculation with extracts of some selected pollens of those to which the sufferer has been found sensitive.

[1] "Asthma and Hay Fever in Theory and Practice", by A. F. Coca, M.D., M. Walzer, M.D., and A. A. Thommen, M.D.; 1931. London: Baillière, Tindall and Cox. Imperial 8vo., pp. 873, with 97 illustrations. Price: 45s. net.

Notes on Books, Current Journals and New Appliances.

PROGRESS IN MEDICINE.

SIX of the volumes of the "Practical Medicine Series", 1931, have come to hand.[1] The volumes are as follows: "General Medicine", edited by G. H. Weaver, L. Brown, G. R. Minot, W. B. Castle, W. D. Stroud and R. C. Brown; "Obstetrics and Gynecology", edited by J. B. De Lee and J. P. Greenhill; "Pædiatrics", edited by I. A. Abt; "General Therapeutics", edited by B. Fantus and L. B. Kartoon; "Neurology and Psychiatry", edited by P. Bassoe and F. G. Ebaugh; "Dermatology and Syphilis; Neurology", edited by F. Wise and M. B. Sulzberger and J. H. Cunningham. This series is well known to members of the medical profession. The editors have taken from the medical journals of the world articles of importance; they have given a short account of the contents and in many instances have added an explanatory or critical note. It is obviously impossible in the space at disposal to discuss the choice of subjects in these books or to refer to the views of the editors. It must suffice to state that medical practitioners studying these volumes will gather much information and will know where to look for fuller details of the latest investigations.

[1] "Practical Medicine Series, Comprising Eight Volumes on the Year's Progress in Medicine and Surgery": "General Medicine"; 1931. Crown 8vo., pp. 814. Price: $3.00 net. "Obstetrics and Gynecology"; 1931. Crown 8vo., pp. 666. Price: $2.50 net. "Pediatrics"; 1931. Crown 8vo., pp. 569. Price $2.25 net. "General Therapeutics"; 1931. Crown 8vo., pp. 467. Price $2.25 net. "Neurology and Psychiatry"; 1931. Crown 8vo., pp. 471. Price: $2.25 net. "Dermatology and Syphilis; Neurology"; 1931. Crown 8vo., pp. 472. Price: $2.25 net. Chicago: The Year Book Publishers.

The Medical Journal of Australia

SATURDAY, AUGUST 13, 1932.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE HONORARY STAFF.

If the average person were asked what public hospitals were for, he would say that they were for the treatment of sick people, and he would probably express surprise that there were other objects. A little thought would show him that nurses have to be trained and that medical students need to "walk the hospitals" if after graduation they are to be worthy of the confidence of patients. He might find it more difficult to understand the importance of adding to medical knowledge by clinical observation and research. The more discriminating among the public will go further and will say, as many have said, that "the doctors get a lot of practice in the hospitals", that they "practise on their patients" and so forth. A great deal is written about hospital administration, hospital finance and the abuse of hospitals by people who can afford to pay for treatment by private practitioners. Very little has been written about the relation of medical practitioners to hospitals, particularly of those who are so fortunate as to secure election to the honorary staff of a large institution, and little has been written about the relation of honorary medical officers of hospitals to those practitioners not on a hospital staff. It is the province of this journal to discuss hospital administration, to aim at securing the most efficient treatment for sick persons and to try by free discussion and plain statement of fact to prevent exploitation of the medical profession. It is equally the province of this journal to discuss the duties of medical practitioners attached to hospitals and to point out the dangers lurking in the everyday path, lest these dangers cause the unwary to stumble and give outsiders reason to point the finger of scorn.

There is no doubt that honorary medical officers of public hospitals have an enormous advantage over other practitioners. They have opportunities for clinical investigation and clinical trial in pathological conditions difficult of diagnosis and equally difficult of treatment. They are introduced to a large section of the public. Surgeons have a large field open before them. They can perfect themselves in the manipulative art, and they have opportunities of forming a mature judgement which otherwise they would take many years to acquire. In their collaboration with other members of the staff honorary medical officers widen their outlook and increase their knowledge. In teaching hospitals they make the acquaintance of many students who may in later years call them in consultation or send patients to undergo remunerative operations at their hands. And so on.

The duties of an honorary medical officer may be discussed broadly from two points of view. First of all, there is his duty to the hospital, and secondly comes his duty to other medical practitioners. On previous occasions the relationship of an honorary medical officer to his hospital has been discussed in these columns. If he does his duty to his hospital, an honorary medical officer sees to the treatment of his patient, he takes his place as a member of the staff by attending staff meetings and by reporting at these meetings any cases of unusual interest, by relating clinical experiences that may be useful to others, and by discussing frankly failures and mistakes. It is to the relationship of the honorary medical officer to other medical practitioners that we wish to refer. The question is of considerable importance at the present time. It is of importance

in all the States on account of the general financial depression; it is specially important in Sydney on account of the new Metropolitan Hospitals Contribution Scheme, recently approved by members of the New South Wales Branch. Many people who formerly paid their private medical attendants are finding it necessary for financial reasons to go to public hospitals for certain forms of treatment. They are sent by general practitioners for minor and major operations, for special treatment such as diathermy, for pathological examinations, and so on. In the experience of not a few, once the patient is seen at a hospital, he is never seen again at the general practitioner's consulting room. This may be the fault of the patient or it may be due to the direct action of the honorary medical officer. Patients who receive treatment for the first time at a public hospital may find that the efficiency of the several departments and the completeness of the treatment are attractive; they may be influenced purely by mercenary motives; in any case, they seem to experience little or no difficulty in persuading the hospital authorities that they are entitled to treatment other than the special treatment for which they were originally sent to the institution. It may be that the hospital makes no attempt to determine the financial status of the patient. Although general practitioners lose patients through the patient's own wandering instinct (and it must be understood that this refers, not to the indigent poor, but to those who find some particular form of treatment beyond their means), this is not the point under discussion. When a patient has recovered from an operation in a public hospital or when some special treatment has been carried out by an honorary medical officer of a special department, the patient should be sent back to his private medical attendant. He should not be asked to visit the surgeon or specialist in his consulting rooms. If the patient has to be seen by the surgeon or specialist after treatment is completed, he should be seen at the hospital, and at this interview instructions to return to the general practitioner should be given. The hospital medical officer would be acting courteously and also in the best interests of his patient if he wrote to the general practitioner telling him what had been done for the patient. It must be rare for a general practitioner to receive from the honorary medical officer of a public hospital any details of the treatment carried out. Those who have written letters of this kind have sometimes been discouraged by the apparent apathy of the general practitioner. If hospital medical officers would regard their hospital practices as distinct from their private practices, and if they would take general practitioners into their confidence, general practitioners would have more faith in specialists and in such schemes as that being introduced in Sydney.

Current Comment.

VITAMINS AND BLOOD COAGULATION.

THE literature concerning the effects of vitamin deprivation on the human and animal economy has already attained gigantic proportions, and fresh avenues of study are being constantly explored. I. N. Kugelmass and E. L. Samuel have made an investigation of avitaminosis and the blood-clotting function.[1] They state that blood coagulability is accelerated by dietary protein and retarded by carbohydrates and minerals which produce bleeding during illness or surgical procedure. They ask whether the clotting mechanism is altered by the gross dietary constituents or by the associated vitamins, and add that clotting time is not a definite criterion of blood-clotting function. They tried to determine the rôle of vitamins in the synthesis and maintenance of the clotting components in the blood by studying the effects of avitaminosis in rats on the blood-clotting function. Determinations of the clotting components were made during normal regimen and when evidence of avitaminosis was apparent. In 1922 W. Cramer kept rats on a diet deficient in vitamin *A*, both in light and darkness. He concluded that ultra-violet rays stimulated the production of blood platelets and that vitamin *A* participated in their production. But vitamins *A* and *D* were not then differentiated. In the experiments of Kugelmass and Samuel the blood taken before the introduction of diet lacking vitamin *A* gave normal values for all the components concerned in the clotting mechanism. In rats the number of platelets is about 500,000 per cubic millimetre—about twice that of normal children. Diets deficient in vitamin *A* produced no change in any of the constituents involved in coagulation, even after two months' deprivation. Beyond that period was first observed a diminution of fibrinogen to about half the initial value after the third month, and then a slight decrease in prothrombin and the

[1] *American Journal of Diseases of Children*, January, 1932.

number of platelets. The clotting index was half normal—paralleling the decrease in the fibrinogen. Vitamin *A* deficiency produces no pronounced change in any of the clotting constituents. The striking fibrinogen decrease is consequent on nutritional dystrophy rather than a concomitant of vitamin *A* deprivation.

A diet deficient in vitamin *B* complex induced no change in any of the clotting components except in the fibrinogen immediately after elimination of vitamin *B*. This was not enough to induce manifestations of bleeding. The fibrinogen decrease is an expression of nutritional atrophy in that the rate of regeneration by the liver is impaired. Vitamin *C* deficiency was tested in guinea-pigs. Scurvy appeared after the second week. Autopsy in one animal revealed hæmorrhage into a hip and knee joint and slight swelling in the forelegs, but no other hæmorrhages. The right ventricle was ruptured by a large blood clot. Another animal had slight hæmorrhage into the joints, but none elsewhere. Avitaminosis *D* produces no change in the clotting components. The hæmorrhage of scurvy is an extravasation of blood from actively functioning cells as a result of degeneration of capillary endothelium. The changes are vascular, not alterations in the character of the clotting components or in the tissues generating these potential clotting substances.

The rôle of the calcium ion concentration in the clotting mechanism has led to studies of vitamin *D* and ultra-violet rays. Prolonged clotting time has been noted in tetany following parathyreoid removal. Kugelmass and Samuel have never observed bleeding disturbances in infants with rhachitic tetany, though the calcium level has been reduced to three milligrammes per hundred cubic centimetres of blood. They refer to the work of other observers. J. C. Brougher by cod liver oil brought clotting time in dogs with parathyreoid tetany to normal. H. Seyle noted acceleration of clotting time after viosterol. Normal clotting time does not guard against bleeding from vascular injury due to infection. A normal clotting time in syphilis or obstructive jaundice within four hours of giving viosterol does not always mean that bleeding from the tissues has ceased. Ultra-violet rays cause varying effects on the clotting mechanism. Increased permeability to red cells, in the nature of a diapedesis, on exposure to these rays has been shown. Leonard Hill observed bleeding from mucous membranes occurring more readily in soldiers marching for long periods under constant exposure to the sun than in those keeping in the shade. Excessive exposure to ultra-violet rays conduces to hæmoptysis in pulmonary tuberculosis. J. W. Sooy observed, after daily exposure to ultra-violet rays, a rise in the number of platelets in a case of thrombopenic purpura. G. Cerutti observed that ultra-violet radiation for ten minutes in some cases reduced coagulation time and prolonged it in others. F. D. Gunn found an increase of thrombocytes in young rabbits exposed to radiation from a mercury lamp. Phillips observed in normal animals increased thrombocytes and shortened clotting time from viosterol.

Kugelmass and Samuel found that vitamin *D* deprivation induced moderate diminution in prothrombin and fibrinogen and slight alteration in the platelet count. The reduction in the blood-clotting index parallels the diminution in prothrombin and fibrinogen, substances associated with the plasma protein level in the blood. The slight alteration in the platelet level casts doubt on the relationship of vitamin *D per se* to platelet formation. Other observers have obtained increased platelet count by stimulating the bone marrow temporarily by vitamin *D* or its equivalents. But vitamin *D* deprivation produces little diminution in the platelet count. It is concluded that vitamin deficiency in the diet produces in the clotting mechanism a tendency to potential bleeding, without actually inducing bleeding. The alteration in the clotting mechanism is the result of nutritional dystrophy rather than of specific vitamin deficiency.

H. N. Sanford, T. H. Gasteyer and L. Wyat have studied the effects of ultra-violet rays and viosterol on new-born infants.[1] They found that, on exposure to ultra-violet rays, bleeding time was decreased and the platelets increased. Prothrombin was consistently lower than normal until the fifth day, when it was higher, but afterwards fell. Antithrombin was lower than normal, except on the third and sixth days. Fibrinogen was increased throughout, the increase being sufficient to double the clotting index on the sixth day. They state that ultra-violet rays stimulate formation of fibrinogen and prothrombin and that this may be similar to the action of whole blood injected in hæmorrhagic disease. The small amount injected could not provide enough coagulation elements to balance the system; there must be a stimulation of the coagulation elements. Viosterol gave results similar to but less regular than those obtained by ultra-violet rays. Fibrinogen was consistently high, but this effect rapidly wore off. On the fifth day the clotting index was increased more than by ultra-violet rays, not by increased fibrinogen, but by diminished antithrombin. This was followed by increased antithrombin and reduction of the clotting index below normal.

In a further study by H. N. Sanford, H. J. Morrison and L. Wyat,[2] it was found that withdrawal of fat and protein from the diet of new-born infants decreased the fibrinogen of the coagulation substances and diminished the power of the blood to clot.

These last observations, however, do not indicate whether the alteration in the clotting function is due to absence of fat *per se* or to associated vitamins. The various studies show some discrepancies which can be eliminated only by further research.

[1] *American Journal of Diseases of Children*, March, 1932.
[2] *Ibidem*.

Abstracts from Current Medical Literature.

RADIOLOGY.

Air and Gas in the Soft Tissues.

D. A. RHINEHART (*Radiology*, December, 1931) states that the earliest positive diagnostic finding in gas infection is the detection of shadows of the gas in the skiagrams, and any film of an injury in which the skin is damaged or broken, including the open reduction of fractures, should be carefully examined for the presence of the shadows of gas. Infection with gas-producing organisms occurs in the same type of injuries that are associated with the presence of small quantities of air in the soft tissues. Compound fractures, gun shot injuries, and penetrating wounds of all kinds may be complicated by gas bacillus infection. If air is present, a reexamination after six hours will reveal no advance in the involvement, while if gas infection is present, the process will always be more extensive. Early in the infection the gas collects around the wound of entrance in the form of small bubbles in the subcutaneous or muscular tissues, and as thin layers under the skin and along the fascial planes. Later in the infection the bacilli spread in the subcutaneous tissues, forming a phlegmon, or they grow in the muscular tissues, causing necrosis and gangrene.

Osteitis Deformans.

W. W. BELDEN AND A. R. BERNHEIM (*Radiology*, February, 1932) describe the clinical manifestations and X ray appearances of *osteitis deformans*. They feel that this group of bone diseases has some relation to metabolic imbalance, governed by the ductless glands, the gland which is probably responsible being the parathyreoid. The localized form of *osteitis fibrosa cystica* does not belong to the same class as the generalized type described by von Recklinghausen. The localized form is a chronic non-suppurative osteomyelitis, but should not be classed with the non-suppurative sclerosing type of osteomyelitis as described by Garré. The authors are of the opinion that generalized *osteitis fibrosa cystica* and *osteitis deformans* are different manifestations of the same disease at different age periods of life, but the localized form of *osteitis deformans* is due to a previous infection which causes a sterile non-suppurative osteomyelitis or osteitis. The authors claim good results from the administration of large doses of calcium lactate, together with vitamin *D* and tomato juice. This treatment is based on the theory that the parathyreoid glands are mobilizers of calcium and control the stream of calcium from the trabeculæ of the bones to the blood. Over-activity of these glands increases the flow of calcium from the bones, with a resulting osteoporosis, increased blood calcium and increased excretion of calcium. When the glands are underactive, the output from the bones is lessened and hypocalcæmia and diminished excretion of calcium occur. In the early stages of *osteitis deformans* we find osteoporosis, high blood calcium and increased excretion of calcium, suggesting an over-activity of the parathyreoid glands. Later in the disease, when the formation of osteoid tissue and the erratic deposition of calcium in the bones occur, the blood calcium is found to be low and excretion is diminished. At first glance it would seem that underactivity had followed upon the preceding over-activity, but because calcium is deposited abnormally in large amounts in the bones, over-activity may be said to persist, with deranged activity as an added factor. Vitamin *D* increases the absorption of calcium through the intestines and it activates the parathyreoid glands. Calcium lactate or milk, vitamin *D* and vitamin *A*, vitamin *B* and vitamin *C* were given, and definite clinical improvement followed. Treatment with parathyreoid extract merely aggravated the symptoms.

Hepatography and Lienography.

W. H. STEWART, MAX EINHORN AND H. ILLICK (*American Journal of Roentgenology*, January, 1932) report a series of eight cases in which thorium dioxide sol was injected intravenously in order to increase the density of the liver and spleen sufficiently to permit of accurate X ray examination. Several injections of three grammes of thorium in saline solution were given at intervals of a day. The injection is fairly well tolerated, but is sometimes followed by severe reactions. The density of the liver and spleen slowly reaches a maximum in about a week or two, depending on the number of injections, and this increase in density is permanent, owing to retention of the thorium in the liver and spleen. The value of the test is in clearly outlining the liver and spleen, thus enabling differentiation from other intraabdominal masses. However, the authors conclude that, except in unusual cases, the test does not seem to yield enough independent information to justify its use.

Ollier's Disease, Unilateral Chondrodysplasia.

R. S. BROMER AND R. L. JOHN (*American Journal of Roentgenology*, September, 1931) report a case of Ollier's disease and give a review of the literature. This disease is characterized by an irregularity and retardation of ossification of the cartilage in the diaphyso-epiphyseal region, affecting principally the diaphyseal ends of the long bones. The cartilaginous tissue does not undergo the normal process of ossification, but persists in the form of nodules or masses, which take a very long time to transform themselves into bony tissue. These chronically persistent masses of cartilage have either a subperiosteal or intramedullary situation, in other words, either superficial or deep. A characteristic feature is that the condition is nearly always unilateral. Healing is apparently spontaneous by replacement of cartilage with bone. The authors conclude that it is not definitely known whether this condition is a distinct entity or an unusual manifestation of the condition known as hereditary deforming chondrodysplasia.

Fractures of the Mandible.

S. W. DONALDSON (*American Journal of Roentgenology*, April, 1932), in discussing the diagnosis and treatment of fractures of the mandible, points out that when a fracture occurs some resorption of the bone occurs at the site as a forerunner of the osteogenetic process. The early callus which is formed, contains very little lime salt and is transradiant. The formation of bony callus takes considerably longer in fractures of the mandible than in the long bones, and thus in these fractures there is no X ray evidence of union until long after the jaw appears firm on clinical examination, due to good fibrous union. At least three to four months should elapse before a radiologist reports non-union in a fracture of the mandible, and in patients with systemic disturbances union may be even slower. In the average normal case firm bony union should be evident in about forty to sixty days.

Chronic Intermittent Duodenal Obstruction.

H. F. SHATTUCK AND H. M. IMBODEN (*The Journal of the American Medical Association*, March 19, 1932) discuss the causes of chronic intermittent obstruction of the duodenum or duodenal ileus, as it is more commonly called. First, there is the group of cases due to peritoneal adhesions or bands fixing the first and second parts of the duodenum. Secondly, there is the group of cases due to pressure on the third part of the duodenum at the crossing of the mesenteric vessels. In many of the cases the only symptoms are indefinite chronic disturbances of the gastro-intestinal tract. The most common symptom is a feeling of epigastric fullness and flatulence, especially after meals. In the more severe cases pain, nausea and vomiting occur and constipation is almost always present. Many patients present toxic symptoms, such as headaches, severe migraine and excessive fatigue. When the first and second parts of the duodenum are involved, the X ray appearance may simulate that of ulcer, except that the deformity is not constant. The part of the duodenum adjacent to the liver may be fixed and present a flattened appearance. When the delay occurs at the crossing of the mesenteric pedicle, dilatation of the duodenal loop with writhing peristalsis occurs. A six hours residue was more common when the delay occurred in the first and second parts. The authors recom-

mend a conservative attitude regarding operation, and since the condition, even without treatment, is not rapidly progressive, they feel that medical measures should be given a thorough trial before operation is undertaken. The medical measures are largely concerned with treating the visceroptosis, constipation and nervous symptoms. Constant treatment and careful regulation of the diet are important.

PHYSICAL THERAPY.

Radium Treatment of Genital Carcinoma.

J. HEYMAN (*Deutsche Medizinische Wochenschrift*, March 4, 1932) reviews the results of the Stockholm clinic in the radium treatment of genital carcinoma and emphasizes the importance of good organization in a special hospital as an important factor in treatment. Close collaboration with the pathological and chemical laboratories is essential. He shows that 20% of the patients with carcinoma of the cervix were cured, five years' freedom from recurrences being used as the standard of estimation. In about 6·5% of the 1,237 patients seen since 1914 the disease was rejected as too far advanced for any treatment. Details of the methods used to radiate the uterus and parametrial tissues are appended. Eighty patients with corporeal cancer were treated during the same period, with an absolute cure in 48%. The author believes in radium treatment first for all cases, followed by operation if this fails or if recurrences be noted. Ovarian carcinoma is best treated with a combination of radium and deep X ray therapy. The earlier results of treatment of carcinoma of the vulva were very bad, but since radium has been used after extensive removal of the tissues by electrocoagulation, the author has had complete cure in 26% of a series of forty-nine cases.

Irradiation in the Treatment of Hyperthyreoidism.

GEORGE E. PFAHLER (*Radiology*, May, 1932) reviews the literature and shows a progressively increasing recognition of the value of both X rays and radium in the treatment of thyreotoxicosis. The results obtained by irradiation are equal to those obtained by surgery, with less shock or risk to the patient. The basal metabolism can be gradually reduced to normal and there is practically no danger of producing hypothyreoidism. None of the author's patients developed tetany, and no harm was done to the normal parathyreoid. The author has a series of 361 patients treated for thyreotoxicosis and shows cure or marked improvement in 87·8%. Finally, the author summarizes the present position of thyreotoxicosis by stating that not surgery, nor irradiation, nor medication can be depended upon to cure every patient; no one method of treatment is so much superior that it can be recommended to the exclusion of the other two. The records show almost exactly as many patients referred by him to the surgeon as were referred to him after surgical treatment had failed. Usually the patients do not reach either the surgeon or the radiologist until the physician has failed to obtain satisfactory results. It is the general opinion of radiologists that all patients whose thyreoids are not seriously involved by mechanical pressure or in whom the condition is so acute as to make delay of a month dangerous, should be treated by irradiation. Irradiation and every valuable method of medication can certainly be combined to advantage. If there is no definite improvement after two or three months, surgical treatment can always still be used. The delay which always precedes operation can be used to advantage in giving irradiation. When irradiation fails, surgical operation can still be used; when operation fails, irradiation can be used. Medication and the advice of the physician are of value in all cases, but there will remain a small number in which all methods will fail.

Continuous Irradiation.

ARTHUR C. HEUBLEIN (*Radiology*, June, 1932) quotes Dr. Ewing in his Caldwell Lecture as saying: "It is no longer possible to maintain that the body furnishes no aid in radiation therapy . . . . Effective irradiation excites a favourable reaction on the part of the body as a whole. The nature of this reaction is complex, and the factors are largely unknown. It is probably of much importance in the cure of malignant tumours by radiation. The immediate improvement in health and strength in leukemic subjects following irradiation suggests some such action." The author then points out that certain types of neoplastic diseases which tend to become widely disseminated early in their course, cannot be controlled effectively by the usual local treatments. Since the early stages of such dissemination are often unrecognizable, and since the earliest possible treatment of metastases offers the best chance for their control, it appears that the greatest hope of success in treating these cases lies in the irradiation of the entire body. In the choice of the radiation to be used everyone is limited by the X ray tubes which can be readily obtained. For continuous operation it is preferable not to run the tube at its maximum rated capacity. At 185 kilovolts and three milliampères ordinary tubes work very well. With a filter thicker than 0·5 millimetre of copper, the irradiation is hard and quite homogeneous. The author quotes Tomanek, who reports a case of myelogenous leuchæmia which responded brilliantly to prolonged irradiation of the spleen by means of the continuous application of radium for a period of three weeks. The patient, who had ceased to respond to small divided doses of X rays, was in the terminal stage of the disease when continuous irradiation was begun. With one Coolidge tube five patients can be simultaneously irradiated, four continuously at long distances, and one at comparatively short range, 150 centimetres. With a filter of two millimetres of copper the intensity of radiation at the near beds is 1·26 *r* per hour; at the far beds it is 0·68 *r* per hour, measured in air. Accordingly, to deliver 25% of an erythema dose (that is, 25% of 750 *r*), a patient in a near bed must be irradiated for 149 hours (or about 7·5 days at twenty hours a day). The writer offers hope in this method for the leuchæmias, the lymphomata and the radio-sensitive carcinomata. The above observations led the author to the conclusion that it is desirable to test the value of prolonged continuous irradiation of the entire body in certain types of neoplastic diseases. At the Memorial Hospital an automatic X ray machine is in use in a special lead-lined ward, in which four patients may be simultaneously irradiated. In addition, provision has been made for the administration to other patients of local intermitttent treatments at a target skin distance of 150 centimetres, the same X ray tube being used. This machine is dependable and economical in operation. The patients selected for the long distance irradiation method suffered from well advanced disease, and many presented widely disseminated lesions. This choice is made primarily to establish a tolerance dose for the entire body and in the hope of observing some beneficial clinical manifestation, such as a stimulation of some defence mechanism against malignant disease. The maximum dose which the entire body will tolerate has not yet been established. However, investigations to determine this dose are being made. At present the author believes that 25% of a full erythema dose of 750 *r*, remeasured in air, delivered at the rate of 1·26 *r* per hour, is a safe dose. Clinical observations and extensive laboratory tests confirm this opinion.

Cancer of the Bladder.

A. GUNSETT (*Acta Radiologica*, March, 1932) gives an account of twenty-six cases of carcinoma of the bladder treated by deep X ray therapy since 1922. Divided doses, given over a period of three weeks, were applied through four and sometimes five ports of entry. The original filters used were one millimetre of copper or zinc *plus* one millimetre of aluminium, but very shortly two millimetres of copper were regularly employed, and as much as 5,000 *R* units given through four out of the five ports of entry. Of nineteen cases, eight remained healed at the end of five years' observation. The author considers that extensive carcinoma of the bladder should first be treated with deep X ray therapy and then, if any remnants of growth remain, electrocoagulation should be employed.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, Albert Street, East Melbourne, on June 1, 1932, DR. GERALD WEIGALL, the Vice-President, in the chair.

Pyelitis and Kidney Pain.

DR. J. LEON JONA read a paper in which he discussed pyelitis and kidney pain. He pointed out that urine secreted by the essential secreting apparatus of the kidney was passed *viâ* the collecting tubules and ducts of Bellini through the pyramids into the calyces. From here the urine was passed through the pelvis to the ureter, down which it was passed by a peristaltic wave to the bladder. The pyramids contained muscular tissue continuous with the musculature of the calyces. The apex of the pyramid was surrounded by a spiral of smooth muscle described by Muschat as the *musculus spiralis* of the pyramid or "milking" muscle.

Dr. Jona dealt with the anatomy and embryology and musculature of the pelvis and ureter, and drew special attention to the fact that the pelvis and ureter were lined with transitional epithelium, while near the apices of the pyramids this became thinned out to a single layer of columnar cells continuous with those of the collecting tubules. It was important to recognize this fact, as the kidney tissue in this region must be more vulnerable to the tip of the introduced catheter, to calculi, or even to crystals in the urine.

The nerves of the kidney passed *viâ* the semilunar ganglion and arose from the splanchnics, and in the dog had been worked out as chiefly from the sixth to the thirteenth dorsal nerves, but fibres were also supplied as high up as the fourth dorsal and down to the third and fourth lumbar. There was also a supply from the vagus, either as direct fibres or *viâ* the semilunar ganglion. The splanchnics contained principally vaso-constrictors to the efferent or afferent vessels of the glomeruli or to the venules. Vaso-dilators had been described in the eleventh to the thirteenth dorsal nerves.

Dr. Jona discussed reflex effects on the secretion of urine from ureter or bladder by stones or the introduced catheter. He pointed out that secretion went on quite well in the completely denervated kidney and was independent of the nerve supply.

Dr. Jona said that pyelitis might occur at any age and in either sex and was frequently the cause of morbidity. He emphasized and illustrated the difficulties of differential diagnosis from surgical conditions, especially appendicitis and gall-bladder conditions.

The signs and symptoms were pain, dorsilumbar or lumbar, of a radiating type, up, down to groin, down to buttock or across the back to the opposite side; headache, shivering, sweating; sometimes vomiting, sometimes rheumatism; tenderness of the kidney in the costo-vertebral angle; pus in the urine, and bacilluria.

In considering the pathology of pyelitis Dr. Jona discussed the physiology of the kidney pelvis. Pyelograms, cinematographic reproduction of pyeloscopy and tracings of the contractions of the normal and pathological kidney pelvis were shown. These have been discussed by Dr. Jona in THE MEDICAL JOURNAL OF AUSTRALIA of July 28, 1928, and in *Surgery, Gynecology and Obstetrics* of July, 1930, and November, 1931.

In reference to the presence of kinks in the ureter, pyelograms of the kidney pelvis in normal pregnancy were shown and compared with the condition in normal non-pregnant persons. It was pointed out that in normal pregnancy most of the kinks were situated in the upper two-fifths of the ureter, where the ureter was normally mobile and not fixed to the peritoneum, as in the lower three-fifths, due to the fact that the pelvis and ureter enlarged and elongated 50% or more over the normal size.

If subinvolution occurred, a dilated pelvis with kinks in the ureter resulted. In some cases the kinks were straightened on passage of the catheter, but in other cases this was not possible and the catheter was stopped at the kink. The importance of these kinks in relation to the possibility of the deposition of crystals was considered.

Apart from kinks of the ureter, diverticula of the ureter, hydronephrosis, lithiasis and other conditions of pathological anatomy demonstrable by pyelograms, the pathological physiology (dysfunction) of the kidney pelvis and ureter as seen by pyeloscopy was considered and illustrated by pyelograms, tracings and clinical history.

Dr. Jona said that dysfunction might be of the nature of: (i) spasm, (ii) relaxation or atony, (iii) antiperistalsis, in relation to (A) pelvis—(*a*) calyx or (*b*) communicating channel or (*c*) "ventricle"; (B) ureter. He described the conditions according to the following tabulation.

(A) *Pelvis*:

(i) Spasm of communicating channel between calyx and "ventricle", most commonly in the upper communicating channel.

(ii) Regurgitation into calyx from "ventricle", commonest in the lowermost calyx. (Dr. Jona illustrated a case of regurgitation in the upper calyx.)

(iii) Condition of general spasm in the whole pelvis.

(iv) Atony throughout the whole pelvis. (In one case illustrated, when three cubic centimetres of "Abrodil" had been injected into the pelvis, the pelvis contracted well, but when it was filled to its painless capacity of fifteen cubic centimetres it contracted very sluggishly, but emptied rapidly with good contractions when one cubic centimetre of pituitrin was injected intramuscularly into the patient.)

(v) Occasionally one calyx only may be in a condition of spasm or relaxation. In the latter case, if hæmaturia is coexistent, the possibility of early malignant disease must be considered if no lithiasis be demonstrable.

(vi) Irregular contractions of the pelvis (a graphic record was shown) accompanied by pain. When the contractions are regularized by therapeutic or other measures the pain disappears.

(B) *Ureter*:

(*a*) Spasm. The commonest sites (illustrated by pyelo-ureterograms) are: (i) Pyeloureteric junction. (ii) About ten centimetres down ureter at junction of "free" and "fixed" portions of ureter. (iii) Along most of the ureter. (iv) At the brim of the pelvis. (v) At the uretero-vesical junction. (vi) In relation to abnormal or pathological structures, such as accessory renal vessels, bands, chronic pelvic cellulitis and chronically inflamed appendix.

(*b*) Antiperistalsis. The wave down the ureter stops at a point of spasm, generally ten centimetres down or at the brim, and then suddenly the "globule" in the ureter is shot back either to the pyeloureteric junction or right into the pelvis or right back into a calyx. (Cases were cited by Dr. Jona in illustration indicating how in such cases the pelvis of the kidney was infected from an infected bladder.)

Tracings were shown by Dr. Jona demonstrating the effects of various drugs on the kidney pelvis and ureter. He summarized them as follows: Quinine causes relaxation of pelvis and lengthening of interval between waves. Aspirin causes slight relaxation and increase in amplitude of waves, slowing down in cases where pelvis is contracting very rapidly. Caffeine causes general sustained contraction and increase in amplitude of waves. Sodium citrate (given intravenously) causes general contraction. Pituitrin causes contraction, hurrying of peristaltic waves in the pelvis and down the ureter. Strychnine causes contraction. Morphine causes contraction. Eserine causes contraction. Adrenaline causes contraction. Atropine sometimes causes marked relaxation, but sometimes causes contraction due to cutting out of vagal control. Histamine, in large doses, causes relaxation (experimental animal). Acriflavine has the same action as histamine.

Experimental investigation of the vagus in the dog indicated that the vagus exerted a depressor action on

the renal pelvic musculation, while the sympathetic exerted an apparent pressor action.

The effects of posture (sitting up and lying down) increased in intraabdominal pressure, and Dr. Jona illustrated the effects on the pressure in the kidney pelvis of elevating or lowering the table on which the patient lay. Sitting up, massage of the kidney, elevating head of table, increase in intraabdominal pressure caused a marked rise in pressure.

The technique of pyeloscopy and pyelography were discussed with the use of sodium iodide, lipiodol, iodipin, "Abrodil", "Uroselectan", "Uroselectan B". The dangers of forcible injection of the kidney pelvis by retrograde filling beyond the "pain limit", with possibility of rupture of the kidney, were dealt with and illustrated. Dr. Jona illustrated this from his article in *Surgery, Gynecology and Obstetrics*, July, 1930.

The great advisability of verifying the position of the tip of the catheter and avoidance of trauma to the kidney pelvis as well as the advisability of filling the pelvis under vision through the fluorescent screen were stressed.

The indications for treatment on the findings of pyeloscopy, both therapeutic and operative, as well as the work of S. H. Harris on section of the nerves on the renal artery in cases of hydronephrosis, were discussed. The question of the possibility of a normal "maintenance filling" in the renal pelvis and the influence of variations of this maintenance filling in regard to kidney pain and the influence of dysfunction of the pelvis or ureter on the amount and rate of urine secretion were also discussed.

In conclusion Dr. Jona said that the experimental investigations on which his paper was based were performed in the Department of Physiology of the University of Melbourne and he expressed his thanks to Professor W. A. Osborne for the use of his laboratories. The clinical investigation was done partly in private practice and partly in the Gynæcological and Radiological Departments of the Women's Hospital, Melbourne, and Dr. Jona thanked Dr. Colin Macdonald, Radiologist to the Women's Hospital, for the use of the facilities provided.

DR. COLIN MACDONALD said that Dr. Jona's work had interested him in two directions: (i) in drawing attention to the value of pyeloscopy as a procedure both independently of and as a preparation for pyelography, and (ii) in emphasizing the fact that a most important element of the upper urinary tract was the muscular element.

To the radiologist a close analogy obtained between the urinary and the alimentary tract, inasmuch as both were capable of peristalsis, antiperistalsis, spasm and variations in muscular tone. The ureter was inherently even more contractile than the bowel. The isolated and denervated ureter possessed contractions as well as the normal ureter, so the central nervous system did not play an essential rôle in their production. The theory usually accepted was that these waves were of myogenic origin. Since they occurred most frequently in those portions of the ureter, namely, the upper and lower thirds, where ganglion cells had been found by some, it was suggested that a ganglionic control was responsible. Others believed that chemical substances in the urine, particularly urea, initiated the contractions; others, that the mechanical pressure of the urine was responsible.

It was well recognized that alimentary spasm, for example, spastic colon, unassociated with any organic lesion, might produce severe symptoms. It seemed reasonable, therefore, to assume that idiopathic ureteral spasm might be responsible for an appreciable percentage of those cases with a history of renal colic, mild or severe, in which all investigations revealed no signs of organic disease.

Recognition of this ureteral peristalsis and spasm prevented radiologists from designating constrictions of the ureter seen on a single pyelogram as an organic stricture, unless there was a persistent finding in the same location and associated with definite evidence of pathological change above, such as early or late dilatations of the renal pelvis and its calyces. Conversely, when the tone of the ureter was impaired by infection such as a chronic pyelitis, a mild degree of ureteral dilatation must not be too readily diagnosed as hydroureter due to pathological change at the uretero-vesical junction, such as congenital stricture, valves or achalasia.

Pyeloscopy showed that spasms of the ureter might disappear either spontaneously or under the influence of smooth muscle relaxants, such as atropine. Morphine, so often given in renal colic, was a smooth muscle stimulant. If given alone, its effect in relieving the patient was by numbing the general sensibility. The pharmacology of smooth muscle explained why atropine and morphine were more effective.

An American radiologist, named Willis Manges, who was Chevalier Jackson's radiologist and was widely known for his work on the X ray diagnosis of non-opaque foreign bodies in the air passages, was responsible for the name and also, Dr. Macdonald thought, for the procedure of pyeloscopy. Manges had been using the fluoroscopic screen as a preliminary to the permanent film record, or pyelogram, since 1912. However, it was not until after the eminent French urologist, Legueu, had published his work, "*La Pyeloscopie*", in 1927, that pyeloscopy met with much recognition.

In Dr. Macdonald's opinion, pyeloscopy had several features to commend it.

Just in the same way as radiologists used the screen as a preliminary to films of the stomach or colon, which were constantly changing their form and outline through peristaltic activity, so it appeared reasonable to screen the muscular urinary tract after that hollow viscus was injected with an opaque material. When 12·5% sodium iodide was the opaque medium, pyeloscopy, in his opinion, was not particularly convincing, especially in adipose patients—the shadow was too faint. But now, when "Abrodil", of 42% iodide content, was available for retrograde injection, this objection was done away with, particularly when a Potter-Bucky grid was used with the screen. However, "Abrodil" or "Uroselectan" was expensive, a definite consideration in these days.

Radiologists hesitated to diagnose gastric carcinoma on one single film of the barium-filled stomach without any screen findings, and in a similar manner they were reluctant to diagnose an early renal tumour on one pyelographic film in which a small filling defect or non-filling of a calyx was shown. Pyeloscopy, by showing the permanence of the filling defect and so establishing its organic origin, obviated the necessity of repeating the cystoscopic procedure. It, too, obviated the disappointment of taking films when the opaque medium ran down past the catheter back into the bladder. It obviated those unsatisfactory cases in which the catheter was jammed into a calyx or against the wall of the renal pelvis, or had even penetrated the renal substance, which mishap sometimes occurred in children under anæsthesia. It prevented overdistension of the pelvis, with its immediate and delayed pain to the patient. It enabled satisfactory and safe pyelograms to be taken in adult patients under anæsthesia. The modern quick change-over device from radioscopy to radiography enabled the film to be taken almost instantaneously after an abnormal appearance had been detected on the screen.

There was only one criticism of Dr. Jona's conclusions about spasm that came to Dr. Macdonald's mind. He felt that one should not be too ready to say that a ureteral spasm was the cause of a patient's symptoms, if spasm were seen on the screen after the ordinary instrumental pyeloscopy. However carefully ureteral catheterization was performed, there must always be some slight trauma to the delicate transitional epithelium of the ureteral mucosa. This in itself was capable of exciting spasm. Dr. Macdonald felt that spasm should be diagnosed only if all other investigations failed to reveal an organic cause.

This objection would be obviated if spasm were shown in the ureter visualized after intravenous urography. Unfortunately, "Uroselectan" and its allies did not cast a sufficiently dense shadow to visualize the ureter satisfactorily on the screen after intravenous injection.

However, intravenous urography was improving; radiologists appeared to have a distinct advance in "Uroselectan B", and he felt the time was not far distant when this objection about instrumental spasm would be removed.

On this question of intravenous urography, which was attracting considerable attention, Dr. Macdonald felt that

intravenous urography would never entirely replace the retrograde method, which had yielded such wonderfully valuable information in the past.

DR. W. G. CUSCADEN thanked Dr. Jona for his paper. He (Dr. Cuscaden) had done out-patient work at the Women's Hospital for a good many years and had treated many patients suffering from chronic pyelitis, the majority of whom took potassium citrate for years. At one time he used to wash out the bladders of these patients with a 2% solution of silver nitrate, and he had thought that this gave good results. Then he had been struck by the fact that in some cases in which he had simply passed a large catheter, the patient had apparently done very well, and he was quite satisfied that the improvement, however obtained, was really due to improved drainage. He was quite sure that the important point in treatment was to provide adequate drainage.

DR. HAROLD MOORE joined in the thanks to Dr. Jona, who had covered a very large range in the course of his lecture, which obviously represented the result of a great deal of work. Dr. Moore welcomed any procedure which might give further information in the investigation of a difficult case, and he thought that theoretically, at any rate, the procedure which gave some idea of the functional activity and the collecting mechanism of the kidney would be of great value, but, like Dr. Macdonald, he was not satisfied that the necessity for passing a catheter did not vitiate the results. He was also interested to hear Dr. Jona's exposition on the action of various drugs on the ureter.

PROFESSOR R. MARSHALL ALLAN said that he had provided some of the material for Dr. Jona's paper and had seen much of the work, and he was very much impressed by it. It was an encouraging example of the association of the clinician and the physiologist. There was a very great difficulty in curing a patient with pyelitis and a definite risk of the pyelitis becoming chronic if not quickly dealt with, and for that reason any work which gave a prospect of a cure, apart from extensive alkalinization, should give better hopes for the future.

DR. KEITH HALLAM also wished to add his quota of praise. In the past the radiologist had relied almost entirely on anatomical features, and he welcomed the invasion of the physiologist into the field. A point he would like to draw attention to was Dr. Jona's use of a non-irritating fluid, such as "Abrodil", in preference to the irritating sodium iodide solution, which mght tend to disturb the functional features of the pelvis. He would like to ask whether the risk of trauma might be overcome by injecting the pelvis after the catheter had been inserted only a very short distance into the ureter so as to avoid at least trauma to the upper part of the ureter.

DR. D. ROSENBERG said he would like to refer to a patient of his who had had pain on the left side and had been ill for three years and who had tried everything from "Doan's Backache Kidney Pills" to doctors' medicine. This patient had been investigated by Dr. Jona, who said quinine was a specific for the condition, and the patient was promptly cured. His only comment would be that if pyeloscopy was to become a routine procedure, as suggested by Dr. Macdonald, there would have to be a reasonable fee. Personally, he was sure Dr. Jona was on the right track.

DR. W. CARRINGTON also wished to thank Dr. Jona, but was unable to add anything further to the discussion. He would like to trespass on Dr. Jona's generosity and ask him to give the doses of the drugs he had referred to.

Dr. Jona, in reply, wished to thank his audience for their attention and appreciation. He was very grateful because, to make any progress, he must have the cooperation of his colleagues. In this respect he would like to thank Dr. Macdonald, in whose department at the Women's Hospital he had done this work. He would also thank Professor R. Marshall Allan and his other colleagues at the Women's Hospital. He quite agreed that it was a harsh procedure to push a catheter up the ureter, and he thought the damage was done when the tip of the catheter was high up in the pelvis, perhaps encroaching on the pyramids, though sometimes blood appeared when the catheter was low down. This was a real objection, but till they got a contrast medium sufficiently dense, they must rely on present methods.

With reference to Dr. Hallam's query, it was possible to fill the pelvis with the tip of the catheter low down in the ureter, but he liked to put the catheter right up as an indication of the possibility of straightening out the kinks in the ureter. This argument applied also to providing drainage which must sometimes be maintained to get a good result. It was also necessary to get the catheter right up into the pelvis in order to get tracings of the pelvic contractions.

He thought diet was of importance, for example, limiting fruit to cut down phosphates; and in some of these cases diet without medicinal treatment would effect a cure.

In reply to Dr. Carrington, the dosage of the drugs was the ordinary therapeutic dose, for example, five to ten grains of quinine would be a reasonable dose.

He thought that the diagnosis on a single pyelogram was quite wrong. Pyeloscopy was helpful in revealing the position of the contrast fluid and showing that the pelvis was filled when the patient complained of pain. If the pelvis was not filled, it was necessary to look for the reason.

A comparison had been made with the barium meal, but he would not look on that as ideal, as no contrast medium was normal. Also, no one knew the effects of the X rays themselves. In most cases the degree of abnormality induced by instrumentation or contrast fluid in the patients under review was sufficiently slight to allow of our obtaining reliable findings.

Correspondence.

PROSTATECTOMY WITH CLOSURE OF THE BLADDER.

SIR: Dr. S. H. Harris has kindly forwarded to me a copy of his criticism of my article on prostatectomy with closure of the bladder, which was published in your issue of July 9, 1932.

I felt bound to describe it as a modification of his own operation, seeing that its possibility was suggested to me during the attempted performance of his technique; previously it had never occurred to me that closure after plastic surgery on the prostatic cavity could be made a safe procedure, and after borrowing so much from him I did not appear justified in laying claim to so much originality. In spite of Dr. Harris's disclaimer then, I must still record my indebtedness while accepting full responsibility.

To deal with the objections raised in their order. I attempted and hoped I had made it quite clear that my main object was the complete control of hæmorrhage by suture; the second objective of Dr. Harris, the reformation of the prostatic urethra, I certainly stated that I could not lay claim to. There seemed no justification for such a claim unless it could be proved by the follow-up, endoscopically, of a number of cases. I referred, however, to one case which I had 'scoped on the twenty-fourth day, and in which I believed this result to have been attained. I have recently examined this man seven months after his operation, for the purpose of following up the treatment of his papillomata, and with the posterior urethroscope I found a smooth floor covered with bladder mucosa as far forward as the *verumontanum*; there was in fact scarcely any scarring to be found anywhere in the posterior urethra. On this account I did lay claim to a certain amount, if not complete, adherence of the cone to the cavity walls. It seems to me that a similar follow-up is necessary to clinch the fact that a tongue of bladder tissue remains permanently fixed at its apex, where it was originally stitched; no doubt Dr. Harris has long ago verified this.

The actual remodelling of the normal tubular urethra I believe takes place by the expansion of the compressed

prostatic tissue which had not been involved in the adenomatous mass.

I did not mean to infer in my necessarily brief description of Dr. Harris's technique that the trigonal "tongue" was merely a mucosal flap: I recognized that it was as dense a structure as my "fringe", which I described as "composed of mucosa, submucosa and trigonal muscle".

Re the possibility of "ledge formation", I recognize that in the moderate-sized cavities, that is, the majority of those seen nowadays, this "tongue", if it adheres permanently, should reconstruct the prostatic floor and prove an obstacle to ledge formation, for ledges in such moderate cases are no doubt due to scarring and healing by second intention. In my own technique I believe I can at least lay claim to a permanent covering of the brim of the cavity, if not to the whole wall. In large cavities I am prepared to dissect up the fringe and remove a wedge from the brim before inserting my sutures, in order to avoid a ledge, but so far my cases have not warranted it.

Although I admit that some slight venous oozing continued immediately after my attempts to perform the Harris operation, there has been no reason to be disappointed in it; on the contrary, I quite believe that any defects were due to my inexperience with the technique, but believing that an obstacle which is difficult to surmount may be circumvented, I looked for another way round.

Re the possibility of sloughing, I feel sure that my oversew purse-string will not produce any sloughing and that the amount of traction used for such a short time has not yet done so either. My first two cases, as I have stated, passed small sloughs, but that I attributed to the use of a tacking stitch (I called it a hem-stitch in my paper, but I have been corrected), since there has been none since.

The likelihood of a diaphragm formation is also slight, the size of the catheter head obviating contracture at the site of the purse-string.

I feel sure that Dr. Harris will accept the above remarks as quite free from dogmatic assurance, but rather as impressions which I hope to be able to confirm; further than that I can only refer to the "conclusion" of my article.

Yours, etc.,

W. JOHN CLOSE.

175, North Terrace,
Adelaide,
July 19, 1932.

PHYSICS.

SIR: Naturally, I have been interested in the letters appearing recently on the amount of physics which is imparted to the present medical student. Although I do take a deep personal interest in the application of physics to medical science, particularly to physiology, I would not dream of setting myself up as an authority as to what the medical student requires to know; I am only a physicist, with a leaning towards the applied side of the science. The standard of knowledge required by students in the Faculty of Medicine is decided by the Faculty of Medicine; they are most emphatic on the points that a wider and sounder knowledge of physics is required by their students, and that the old days of a pass on a nominal mark should not recur.

I think Dr. Scot Skirving sums the matter up in a line: "The future of most medical students lies in ordinary practice." At present the only method of qualifying for this very important ordinary practice is through the University, which must necessarily provide an advanced scientific course, of standard consistent with the teachings in other faculties and with faculties in other recognized universities.

Of the engineering course at the University it might equally be said that students "take" the sciences to a much higher standard than most of them are ever likely to require in ordinary practice; but if boys wish to qualify as ordinary professional engineers, they can get an excellent course at the Technical College which satisfies their requirements. Is apprenticeship to a qualified practitioner and a Technical College course the solution to the problem in medicine also?

I think that a further difficulty arises in that Dr. Scot Skirving's "ordinary practitioners" refuse to recognize their limitations—being medical practitioners, they rather feel that they can do anything within the range of medical and surgical practice as well as can any of their *confrères*; and that without the necessary knowledge of either the pure or the applied sciences, they can "take on" any modern scientific developments by virtue of some divine power conferred upon them when they were "dubbed M.B." I agree with the letter in this same issue (August 6) which criticizes severely the freedom of pharmacists to employ diathermy machines, but is the Medical Board quite happy about the very large number of diathermy and of X ray plants in the hands of "unqualified" medical practitioners?

I sympathize with those who have not graduated in recent years who attempt to "read" the text book "Booth and Nicol". I am sorry that Dr. Edwards compares it with a "railway time table", though that is a very useful pamphlet for anyone who needs it and knows how to use it. I had likened it in the preface to a skeleton. I admit that it requires considerable amplification by description and experimental matter, which would make it unnecessarily bulky as a reference book; but that "nearly two-thirds of the book consists of unadulterated mechanics and higher mathematics, which are in no way necessary in considering elementary physics" is a misstatement: only one-fifth of the book is mechanics, adulterated or otherwise, and no higher mathematics are employed; and the matter in the book is necessary in considering even elementary physics to the standard required by the Faculty of Medicine.

Dr. McKillop is also better armed than I, in that he can make authoritative statements as to what physics is required by medical students; however, when he says: "But to expect an unfortunate first year medical student to assimilate the higher mathematics of physics is the height of academic idiocy", I can agree with him, except for the "is"; they get here none of the higher mathematics of physics, their work being really a very elementary introduction to the subject; they would have to go further, even to read Bayliss's "Physiology".

The Australasian Medical Publishing Company has in the press at present an elementary text book on physics by me, which will provide the course that seems to be advocated by your correspondents. I admit that it will be much more interesting reading than the larger book; it contains a negligible amount of mathematics, and it covers the "real elements" of the course; it does include a few Greek symbols; and I have had to refer occasionally to sines, tans, and cosines, otherwise I can guarantee that it does not contain what Dr. Edwards humorously refers to as Arabian, the Indian Sign Language, and Mah Jongg. Whilst it might have been sufficient in 1905, I do not think that it will be accepted as more than the "light reading" to accompany the bigger book, so far as first year medicine is concerned. I hope not, anyway.

I seem to have overlooked the letter from Dr. Sutherland; that is not the case. He certainly mentioned at our meeting that he had "taught himself ancient Egyptian". I will beg him to keep his copy of the big book for a month and I will send him a presentation copy of the introductory and supplementary book, so that perhaps he will have two books to donate to a medical society's library, or perhaps he may then keep them both.

Yours, etc.,

EDGAR BOOTH.

University of Sydney,
July 11, 1932.

POLIOMYELITIS.

SIR: In reference to the case of poliomyelitis reported by Dr. Goldberg in THE MEDICAL JOURNAL OF AUSTRALIA of July 16, as one in which "paralysis disappeared completely in thirty-six hours" after the administration of serum, I

would like to point out that the diagnosis can hardly be considered definite in view of the absence of an increase in the cell content of the cerebro-spinal fluid and the rapid disappearance of apparent paralysis of both legs. In my experience in the recent epidemic these findings were not met with in genuine poliomyelitis. It is sometimes difficult to be sure of paresis in young children at a single examination, particularly if the child does not cooperate.

It cannot be too strongly emphasized that convalescent serum, if it is to be of value, must be given in the early preparalytic stage. It seems sometimes to prevent further spread of paralysis when given in the paralytic stage, but it cannot restore the function of anterior horn cells once this has been lost. In the case reported by Dr. Goldberg I would not have administered serum, and I do not attribute the prompt recovery to its use. At the same time I fully appreciate the difficulties of diagnosis in country districts where cases are few and scattered.

Yours, etc.,

KAREN HELMS,
Medical Officer to the Infantile Paralysis Committee of New South Wales.

135, Macquarie Street,
Sydney,
July 20, 1932.

Diary for the Month.

AUG. 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
AUG. 17.—Western Australian Branch, B.M.A.: Branch.
AUG. 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
AUG. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 25.—South Australian Branch, B.M.A.: Branch.
AUG. 25.—New South Wales Branch, B.M.A.: Branch.
AUG. 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. R. H. Macdonald (B.M.A.) has been appointed Government Medical Officer at South Grafton, New South Wales.

* * *

Dr. L. W. Wing (B.M.A.) has been appointed Government Medical Officer at Pambula, New South Wales.

* * *

Dr. G. B. R. Wooster (B.M.A.) has been appointed Deputy Medical Superintendent, Department of Mental Hospitals, New South Wales.

* * *

Dr. D. W. H. Arnott has been appointed Deputy Medical Superintendent, Department of Mental Hospitals, New South Wales.

* * *

Dr. P. J. O'Shea (B.M.A.) has been appointed Senior Medical Officer, Department of Mental Hospitals, New South Wales.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes*, sought, etc., see "Advertiser," page xiv.

GEELONG DISTRICT HOSPITAL, VICTORIA: Junior Resident Medical Officer.

LAUNCESTON PUBLIC HOSPITAL, TASMANIA: Resident Medical Officer (male).

ROYAL HOSPITAL FOR WOMEN, SYDNEY, NEW SOUTH WALES: Resident Medical Officer, Junior Resident Medical Officer.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £1 for Australia and £2 5s. abroad *per annum* payable in advance.